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JANUARY 2, 1943

Railway Age

ANNUAL STATISTICAL AND OUTLOOK NUMBER

M5583
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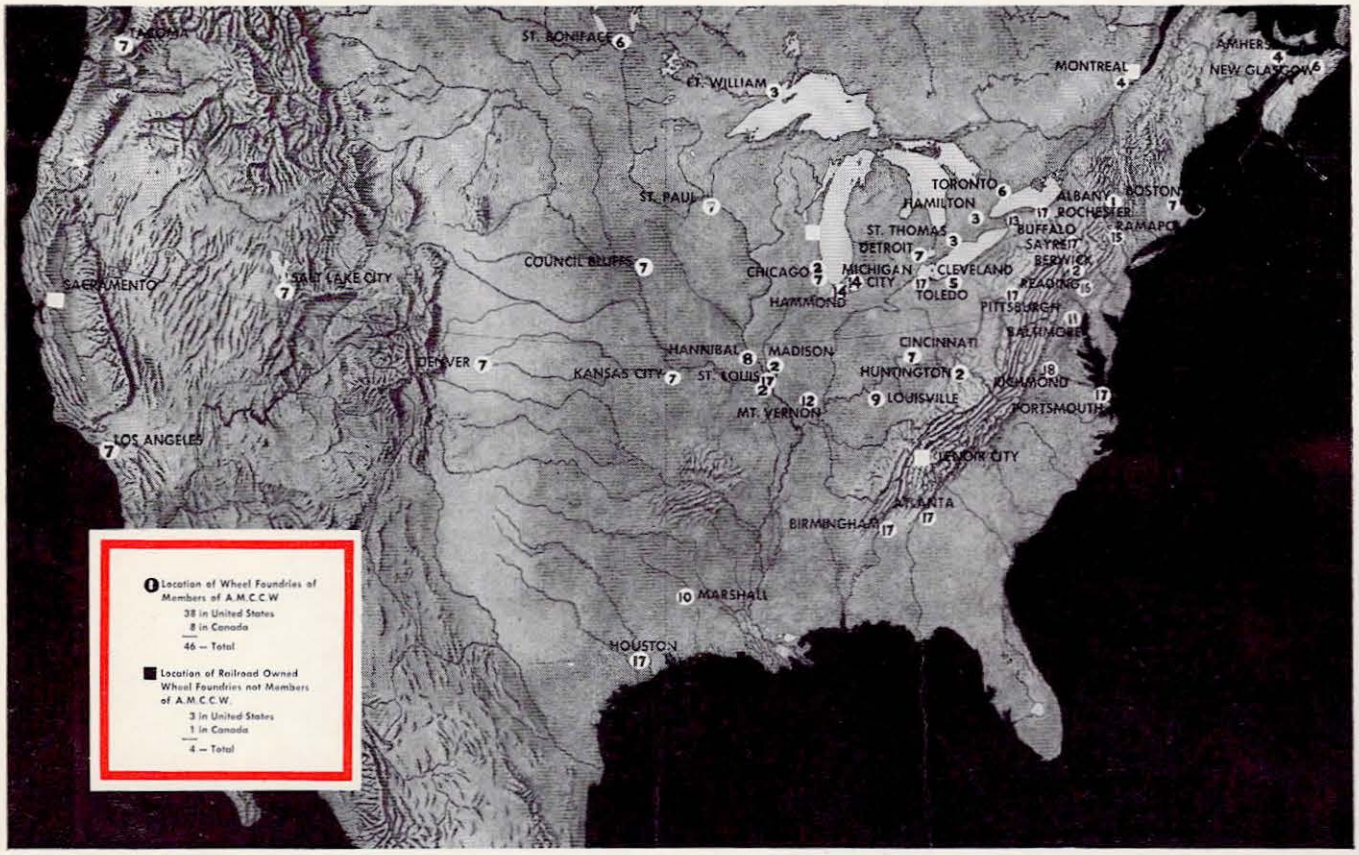
KERITE *Keeps Rolling Along*

or upwards of a century since Day's
ivention, Kerite has rolled up a record
or efficient and permanent insulation,
nequaled in the whole history of the
lectrical industry.

THE KERITE INSULATED WIRE & CABLE COMPANY INC

NEW YORK CHICAGO SAN FRANCISCO



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PLANTS STRATEGICALLY LOCATED

to Better Serve All Railroads

Chilled Car Wheel plants are strategically located to provide the railroads quick and efficient service, reduced delivery charges and a handy market for scrap wheels.

Spot the dot on the map nearest to the point where you want delivery; then check the list of member manufacturers for the one to call on to best serve your requirements.

The membership of this association includes every manufacturer of Chilled Car Wheels in North America excepting railroad plants.

1. Albany Car Wheel Co.
2. American Car & Foundry Co.
3. Canada Iron Foundries, Ltd.
4. Canadian Car & Foundry Co.
5. Cleveland Production Co.
6. Dominion Wheel & Foundries, Ltd.
7. Griffin Wheel Company
8. Hannibal Car Wheel & Foundry Co.
9. Louisville Car Wheel & Railway Supply Co.
10. Marshall Car Wheel & Foundry Co.
11. Maryland Car Wheel Co.
12. Mt. Vernon Car Mfg. Co.
13. New York Car Wheel Co.
14. Pullman-Standard Car Mfg. Co.
15. Ramapo Foundry & Wheel Works
16. Reading Car Wheel Co.
17. Southern Wheel Division of the American Brake Shoe & Foundry Co.
18. Tredegar Iron Works

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS

230 PARK AVENUE,
NEW YORK, N. Y.

445 N. SACRAMENTO BLVD.,
CHICAGO, ILL.

AMCCW

ORGANIZED TO ACHIEVE:

Uniform Specifications
Uniform Inspection
Uniform Product

3183

Published weekly by Simmons-Boardman Publishing Corporation, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the act of March 3, 1879. Subscription price $6.00 for one year U. S. and Canada. Single copies, 25 cents each. Vol. 114, No. 1.

FOR OUR ARMED FORCES

INDUSTRIAL AMERICA HAS PLEDGED

ALL-OUT AND EVER-INCREASING PRODUCTION

FOR OUR ARMED FORCES

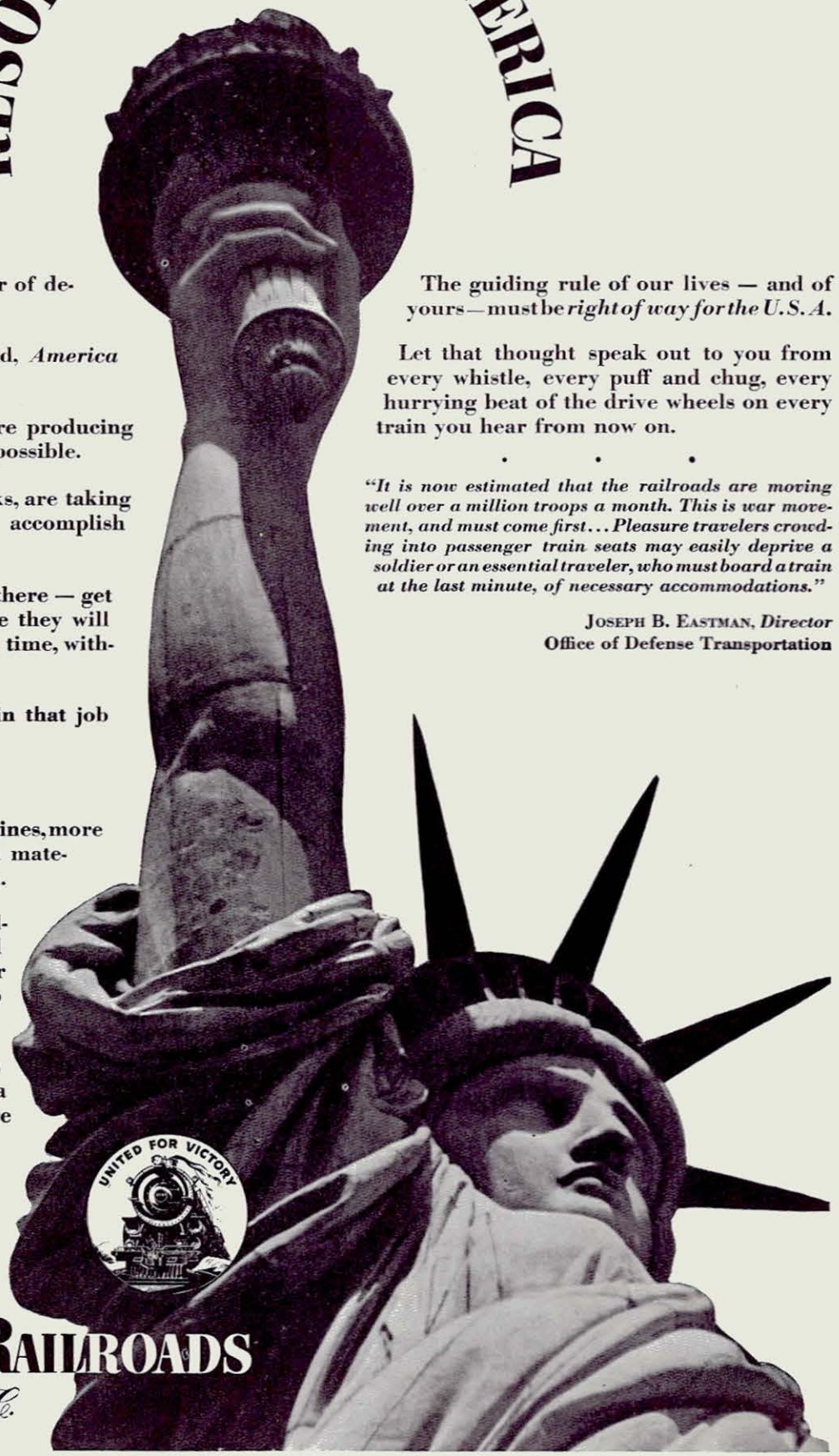
—THAT THEY MAY QUICKEN THE DAY OF VICTORY

—THAT THEY MAY RETURN IN SAFETY

—AND THAT THE WORLD MAY BE ASSURED

OF A LASTING PEACE

RESOLUTION FOR AMERICA



This year must be the year of decision.

This year, all over the world, *America fights.*

Our factories and farms are producing the materials to make that possible.

Our ships, planes, guns, tanks, are taking swift shape in numbers to accomplish conclusive results.

These things must now get there — get where they're needed, where they will be felt—get there swiftly, on time, without fail or falter.

The railroads have a part in that job —a big part.

They accept it.

They could do with more engines, more cars, more everything when materials can be spared for them.

Until then and after, railroads and railroad men will continue to work as they never worked before to get the job done.

If, now and then, that means inconveniences to you as a traveler, we are sorry. We are trying to avoid that, too.

But guns and the men who use them must come first.

The guiding rule of our lives — and of yours — must be *right of way for the U.S.A.*

Let that thought speak out to you from every whistle, every puff and chug, every hurrying beat of the drive wheels on every train you hear from now on.

• • •

"It is now estimated that the railroads are moving well over a million troops a month. This is war movement, and must come first... Pleasure travelers crowding into passenger train seats may easily deprive a soldier or an essential traveler, who must board a train at the last minute, of necessary accommodations."

JOSEPH B. EASTMAN, *Director*
Office of Defense Transportation

Association of
AMERICAN RAILROADS
Washington D.C.

(*Photo Courtesy New York Central Lines*)

"A CLEAN TICKET FOR ANOTHER 100,000 MILES"

There is a shortage of new locomotives . . . for the duration. But, you can keep your present motive power fit for turning and doubling-back by the simple process of adopting a complete water treatment program. Under Dearborn supervised water treatment, shoppings to replace burned flues, blistered sheets, and leaky flues and bolts are reduced to a minimum and extensions obtained up to the I.C.C. limit . . . out-of-service shop time is cut to the bone. Locomotives work efficiently up to the legal limit between washouts. Time-wasting water changes are a thing of the past. Locomotives give straight line performance with time out only for between-trip lay-overs, and for regular authorized Federal Government inspections.

Over 200 railroads use this service to keep their locomotive boilers in trouble-free condition. If you're not one of them, investigate. A Dearborn Engineer is nearby to serve you.

DEARBORN CHEMICAL COMPANY

310 S. Michigan Ave., Chicago 807-15 Mateo St., Los Angeles
205 E. 42nd St., New York 2454 Dundas St., West, Toronto

Dearborn

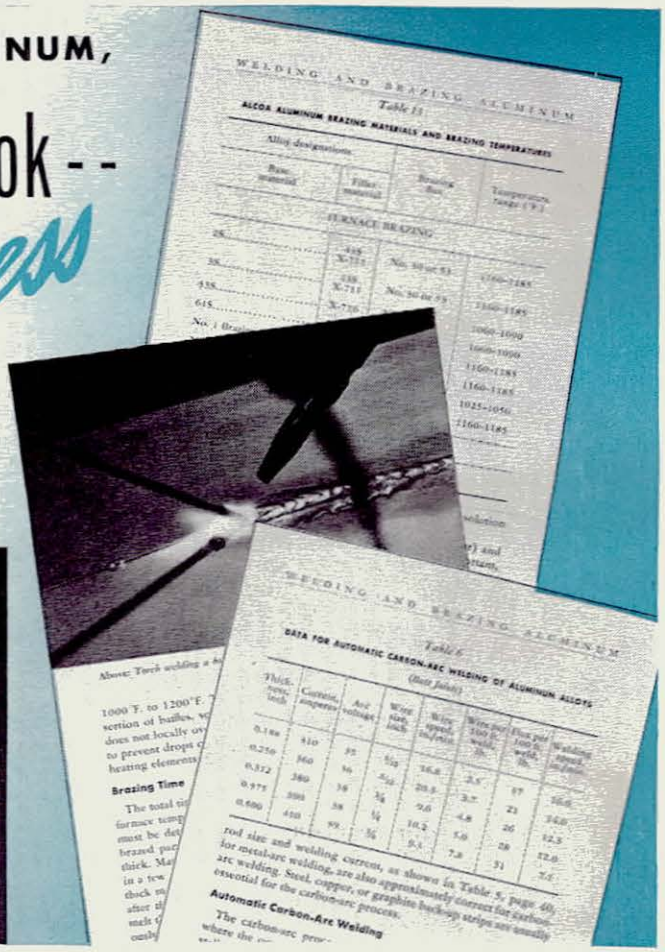
TRADE MARK REGISTERED

SCIENTIFIC WATER TREATMENT

IF YOU'RE WORKING WITH ALUMINUM,

you should have this book--

just off the press


WELDING AND BRAZING ALUMINUM
Table 11
ALCOA ALUMINUM BRAZING MATERIALS AND BRAZING TEMPERATURES
WELDING AND BRAZING ALUMINUM
DATA FOR AUTOMATIC CARBON-ARC WELDING OF ALUMINUM ALLOYS
Brazing Time
Automatic Carbon-Arc Welding

WELDING AND BRAZING ALCOA ALUMINUM

Here's a book of data designed to meet the needs of the practical man—the welder—who is working with Aluminum Alloys. It describes in detail the practices now widely employed for joining Aluminum parts by gas welding, arc and resistance welding, and by brazing.

This book is planned to assist the war effort by making every welder more proficient at his job. Typical subjects covered are: Welded joint design—preparation of parts—types of welding equipment—electrodes and fluxes—tip selection and flame adjustment—inspection and finishing—strengths of welds.

Joining Aluminum Alloy parts by welding and brazing is readily mastered with knowledge like this at your command, plus a little practice. You may have this book free. Use the coupon to send for your copy today.

ALCOA

ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA,
2178 Gulf Bldg., Pittsburgh, Pa.
Please send me this new book.

Name_____

Company_____

Street_____

City_____

FIRST AID TO A FACTORY

Traditionally, our railroaders mind their own business. Any railroader will tell you that's enough to keep him busy, especially when he and his brothers have to move 6,500,000 troops in nine months. And, meanwhile, keep the regular trains rolling.

Yet every so often railroaders have to come to the rescue of other citizens who get into trouble. Such as putting out fires in roadside villages. Such as hooking on and hauling motor trucks out of ditches. Such as making record runs carrying life-saving physicians. And a lot of things like that which seldom get beyond routine reports from the trainmen to the front office.

But now and then something pops up that is really unusual. Such as first aid to a factory down at Birmingham, Alabama.

The factory, in peacetime, was just one of a thousand which turned out chemicals for everyday purposes. Soon after Pearl Harbor it went in for "conversion." It revamped its machinery and operations so it could make a line of synthetic chemicals which are used for explosives, medicinal purposes, and insecticides. Oddly enough, the genuine materials had formerly been obtained from Japan.

The Birmingham factory was doing a swell job for its country in war-goods production when some boiler tubes split in its power plant. This meant shutting down, leaving a large number of people out of work, and delaying production until repairs could be made.

Like thousands of other factories, this one in Birmingham habitually relied on railroads. When its boiler tubes split and its machinery stopped, it wanted help in a hurry. So it telephoned to the nearest railroad roundhouse. The foreman referred the factory to the master mechanic, who called up the division superintendent, who authorized spotting a passenger locomotive on the factory's sidetrack.

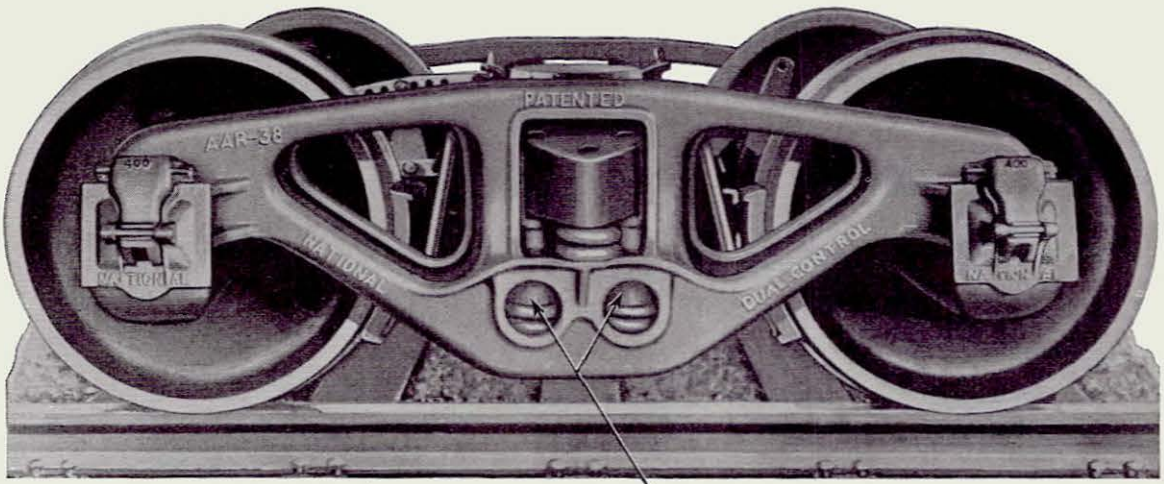
In a short time after the factory's accident a pipe connection was made between the locomotive boiler and the factory's steam plant. Hogger, tallowpot, and stoker went into action, feeding railroad steam into factory machinery, until the factory's own boiler tubes had been repaired. Then the borrowed locomotive disconnected itself from wartime chemical manufacturing, whistled a "God bless you" and went back to hauling passengers on its main line.

—The Trackwalker

AMERICAN LOCOMOTIVE • GENERAL ELECTRIC

114-33-9500

National Car and

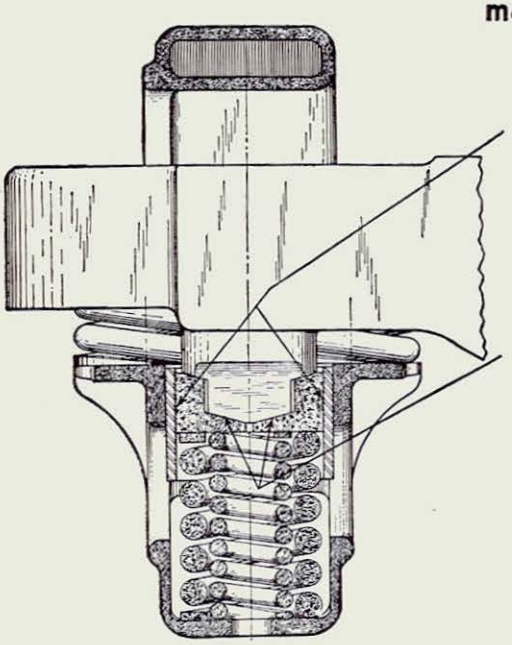


TWO FRICTION UNITS

Spring and Friction elements that control both vertical and horizontal oscillations are built into

NATIONAL B-1 TRUCKS WITH DUAL CONTROL

These controls assure smoother riding and greater safety at the higher freight speeds. This is a protection to both car and lading which shows in reduction of maintenance costs.



Section thru Control Unit

CONTROL No. 1

Vertical oscillation or spring bounce is friction controlled by pressure of wedges against a steel bushing, during spring action. This protects the lading.

CONTROL No. 2

Horizontal oscillation is controlled by opposing angles of incline on the friction wedges, which center the bolster trunnions and resist forces which tend to throw the truck out of square. This is necessary for safety in high speed service.

Complies with all A. A. R. Specification Requirements

NATIONAL MALLEABLE AND STEEL CASTINGS CO.
General Offices: CLEVELAND, OHIO
Sales Offices: New York, Philadelphia, Chicago, St. Louis, San Francisco.
Works: Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park, Ill.

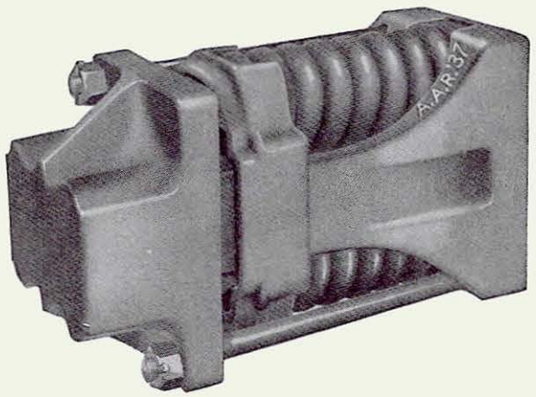
Lading Protection

Heavier loads, longer trains and higher speeds make new demands on every item of freight car equipment.

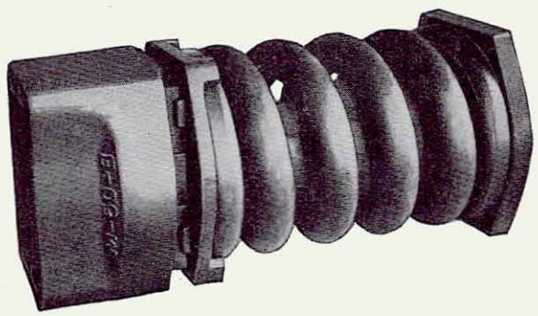
Draft gears especially must be able to stand terrific punishment if they are to provide proper protection to the car and its contents.

NATIONAL FRICTION DRAFT GEARS

made of Naco Steel are designed to meet these extreme conditions. Their smooth action and high ultimate capacity affords the greatest protection to the car and lading.



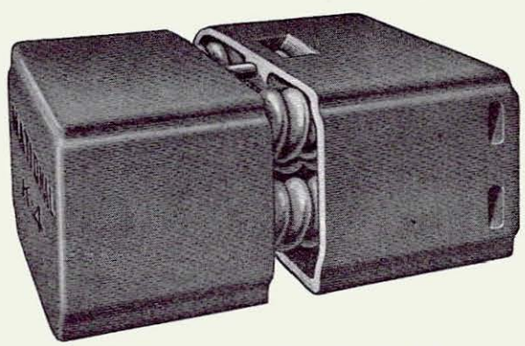
Type M-17-A—22 3/8" long
A.A.R. Approved



Type M-50-B—20 1/8" long
A.A.R. Approved

National K-4 Draft Gear designed especially for passenger car service, starts action smoothly, gradually building up resistance sufficient to absorb the heavy blows without shock, and releases quickly and smoothly. Modern streamlined trains require such a gear.

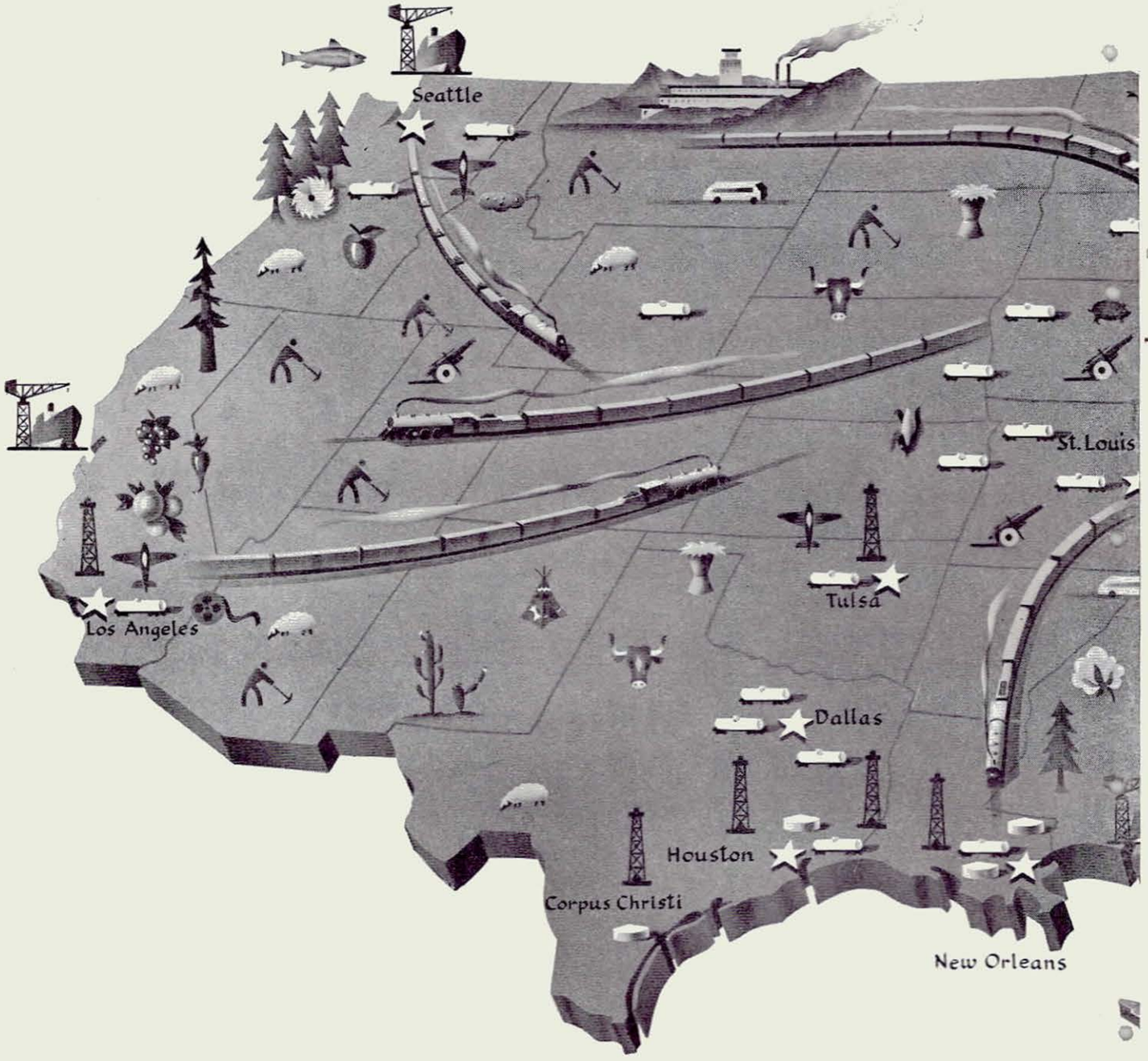
Specify NATIONAL Draft Gears for efficient, economical service.



NATIONAL K-4 DRAFT GEAR
Designed especially to meet the requirements of high speed passenger service.

NATIONAL MALLEABLE AND STEEL CASTINGS CO.
General Offices: CLEVELAND, OHIO
Sales Offices: New York, Philadelphia, Chicago, St. Louis, San Francisco.
Works: Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park, Ill.

A Strategic Map for

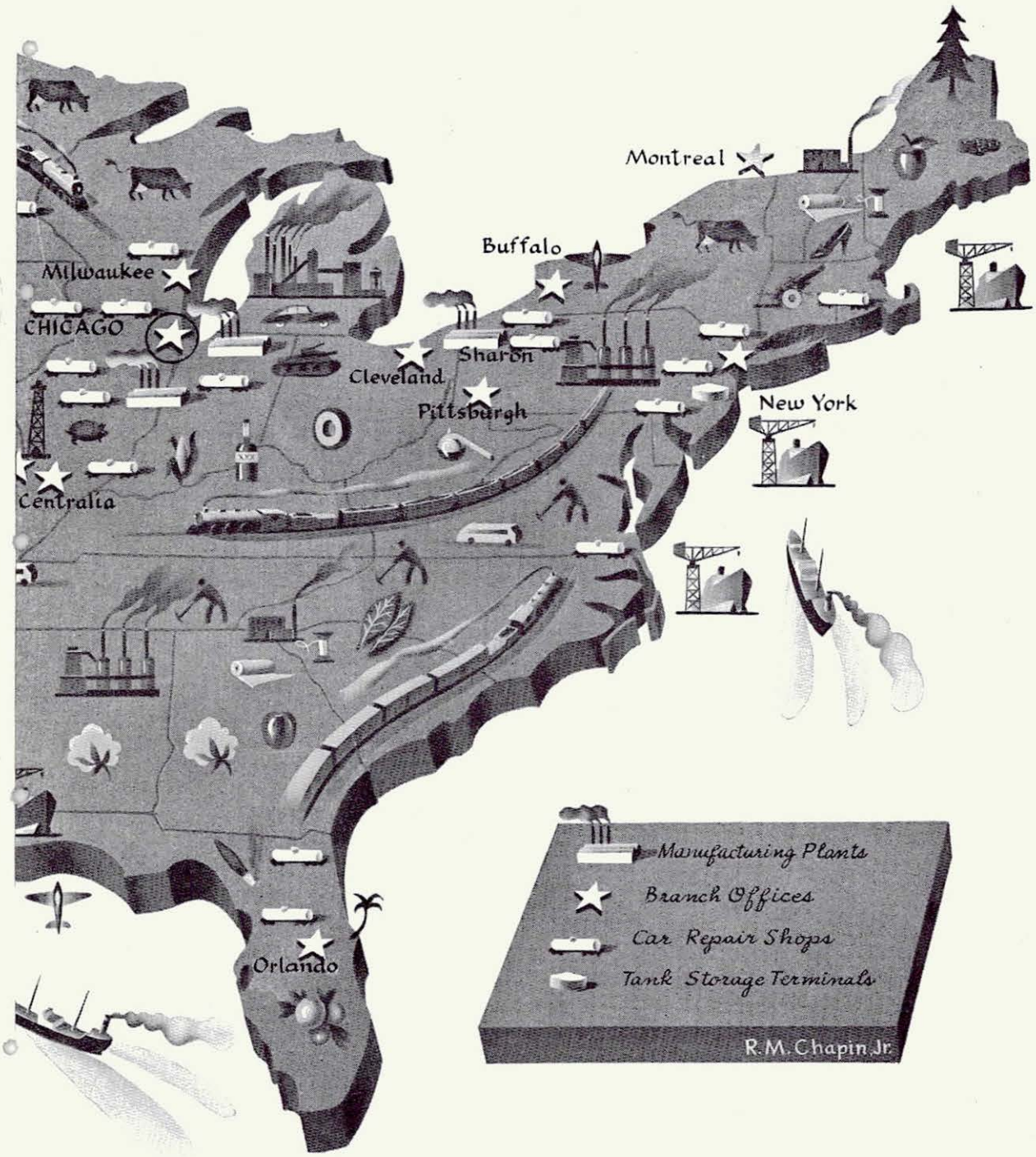


This map shows how the services of General American Transportation Corporation cover the entire nation. Branch offices, plants and repair shops are conveniently situated throughout the United States. Strategically located terminals make possible low shipping rates to and from foreign ports. Manufacturing plants are situated in the East and Middle West, near raw materials and convenient to car users.

GATX GENERAL AMERICAN

A SYMBOL OF INTEGRITY FOR OVER 40 YEARS

American Industry



GENERAL AMERICAN TRANSPORTATION

CORPORATION

Chicago

Builders and Suppliers of Railroad Freight Cars

28 ways to Improve the Operation of Your Wires and Cables

1. SHOW YOUR MEN HOW TO SPLICE CORRECTLY – Send for this free wall chart that tells how to make a perfect splice in rubber insulated cables for operation up to 5000 volts. Post it where the work is being done. It is valuable not only for instructing new electricians but will help improve workmanship of old timers. Many cables can be salvaged by making repairs in damaged cables or splicing together short lengths of new cable.

2. SHOW THIS FILM TO YOUR ELECTRICIANS – For better understanding of wires and cables, show the Okonite 2 reel sound film "Rubber Insulated Cables", available free in 16 and 35 mm. size.

3. STORE CABLES IN A COOL PLACE – High temperatures tend to break down rubber. Stored in a cool (not cold), uniform temperature, cable insulation is kept in the best condition for the longest possible life. Always avoid extreme temperatures.

4. KEEP REELS AND COILS OFF GROUND – Continued moisture rots wooden reels heads and fibrous cable coverings. Sound reels are easier to handle and well-preserved cable coverings give longer life in service.

5. PROTECT CABLES FROM WEATHER – Sunshine, light, rain, snow and freezing can hasten deterioration of rubber sheaths and fibrous coverings. Keep cables under cover. Otherwise, be sure to keep lagging on reels.

Remember this basic idea – You can operate cables more efficiently by reducing the temperature of the surrounding air (ambient temperature) because insulation will then last longer with the same conductor load, or more current can be carried in the same cable without shortening its life.

6. KEEP RISER CABLES ON THE NORTH or most shaded side of the poles – away from the heat of the sun.

7. IN HOT MANHOLES, INSTALL VENTILATING FANS and perforate manhole covers to drive hot air out.

8. ON BRIDGES, VIADUCTS, ETC., PLACE CABLES BELOW THE STRUCTURE for protection from sun and weather. This also is more likely to safeguard cables from accidental mechanical damage, vandalism and sabotage.

9. FOR AERIAL CABLES STRUNG ON MESSENGER – preserve sheaths and fibrous coverings with weatherproof paint to stop corrosion and flaking of saturants.

10. WHERE WEAR MAY OCCUR, such as in duct mouths, protect your cables with a semi-circular abrasion-resistant sleeve.

11. SPLICES WILL LAST LONGER when protected by a coating of weatherproof paint.

12. PROTECT THE JOINTS OF CABLES IN MANHOLES from fire by proper fireproofing.

13. UNDERGROUND INSTALLATIONS (without ducts)—keep ground saturated with water to lower earth temperature and dissipate heat more readily.

14. TUNNEL INSTALLATIONS—ventilate tunnels with grills where possible or install a blower at one end of the tunnel to force hot air out. Make sure circulation goes all the way through tunnel so hot air does not pile up at one end.

15. DUCT INSTALLATIONS – when possible circulate cool water through or flood duct lines and keep manholes flooded. But be sure your cables are water-tight.

16. NEAR HEATING UNITS or hot pipes, move the wiring or insert baffles between steam pipes and cables to deflect hot air from the cables.

17. IN HOT ROOMS – provide circulation by the use of fans to blow-hot air away.

18. WHERE ONLY MILDLY HIGH TEMPERATURES EXIST – cut air vents in the ceiling or partition above cables to provide adequate circulation by means of natural convection.

19. INSPECT CABLES for evidence of mechanical distortion at conduit edges and for surface deterioration and abrasion. Eliminate trouble here by retraining cables and applying protective paint.

20. VENTILATE POLE RISER CONDUITS and create circulation by making openings near the top or by leaving space between conduits and pothead. This can improve the efficiency of an entire conduit.

21. SPACE YOUR CABLES as close together as possible on overhead circuits if you need to reduce reactive voltage drop. Leave sufficient space for air circulation to prevent overheating.

3165

22. PROTECT cords from being run over by heavy moving equipment, dragged around sharp corners, yanked to remove kinks.

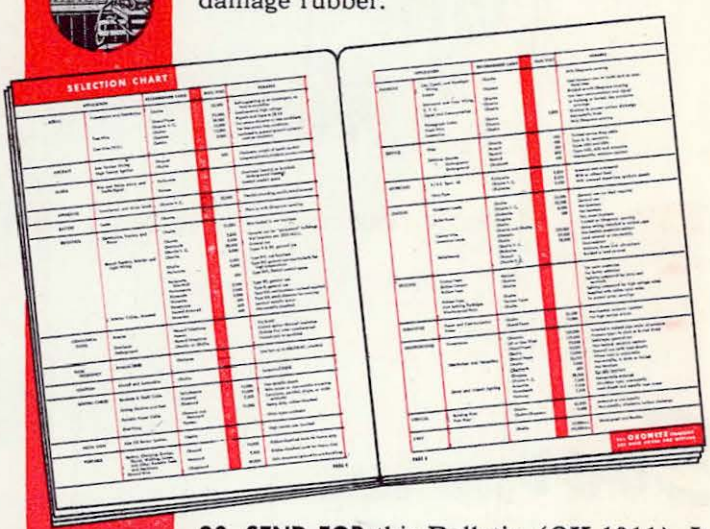
23. SHIFT cords and cables away from high voltage equipment and sparking motors. Such machines generate ozone which attacks rubber and hastens its deterioration.

24. DON'T run cords and cables over small diameter pulleys or drums. Continued bending and flexing around a short radius breaks the conductors. Use larger diameter pulleys.

25. WIPE cords regularly so they are free from oil, grease and chemicals. Such agents attack rubber.

26. KEEP cords out of light and sunshine as much as possible when in use. Light tends to harden rubber – thus hastening cracks.

27. MOVE cords away from steam lines, furnaces and hot objects. High temperatures damage rubber.



28. SEND FOR this Bulletin (OK-1011). It is invaluable in deciding what cable to use for specific jobs. It contains, in addition to the Selector Chart, the following: Recommended types of insulation – Conductor stranding and designs – Protective coverings for various conditions – How to approach the problem of getting cable today – Purchase specifications – Data to include in your inquiries to speed handling.

THE OKONITE COMPANY

Passaic, New Jersey

Offices in Principal Cities

OKONITE

INSULATED WIRES AND CABLES

BUY U. S. WAR BONDS *Every Payday All Okonite Employees* BUY U. S. WAR BONDS

Putting the "V"

Ever since the war began, SKF-equipped locomotives have been hauling SKF-equipped cars loaded with troops and weapons to where they're needed most. And when the final victory has been won, you'll find that the long life and reliability of SKF and SKF-ASF Roller Bearing Units have had much to do with keeping rolling stock ROLLING.

5204

SKF INDUSTRIES, INC., PHILADELPHIA, PA.

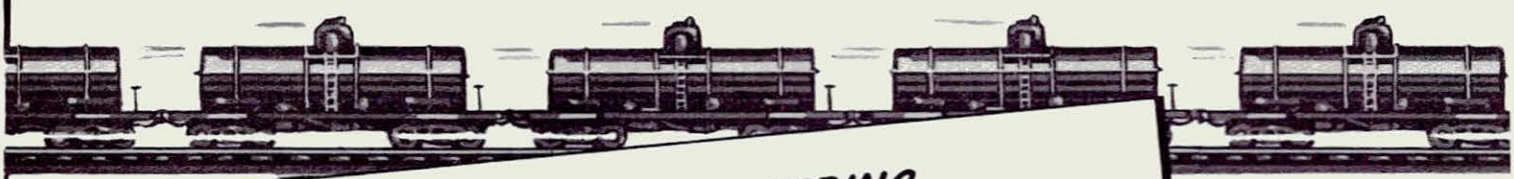
into VICTORY

WITH SKF-EQUIPPED TRAINS

SKF

BALL AND ROLLER BEARINGS

How to get more existing cars



IMPROVE ALL-COIL SPRING GROUPS BY REPLACING ONE A.A.R. SPRING WITH A SYMINGTON SNUBBER . . . . .

THIS ECONOMICAL METHOD

- Eliminates Destructive Car Bounce.
- Prevents Solid Blows.
- Reduces Coil Spring Breakage.
- Keeps Cars Off Repair Track.
- Lowers Track Maintenance.

THE SYMINGTON-GOULD CORPORATION

Works: ROCHESTER & DEPEW, NEW YORK

New York Chicago St. Louis Baltimore Boston San Francisco

In Canada: ADANAC SUPPLIES, LTD., Montreal, Que.

service from

PRESENT RESTRICTIONS on the use of rubber have made necessary the withdrawal from the market, for the emergency, of our type SBR Snubber.

The type SBS Snubber which we are now furnishing operates on the same basic principle, the rubber block being replaced by transverse coil springs which force the friction shoes against the inner wall of the snubber sleeve, producing constant frictional control.

The SBS Snubber was developed early in 1940 and its durability and efficiency in controlling truck spring action have been proved by laboratory and road tests and in actual service for more than two years.

TYPE SBS

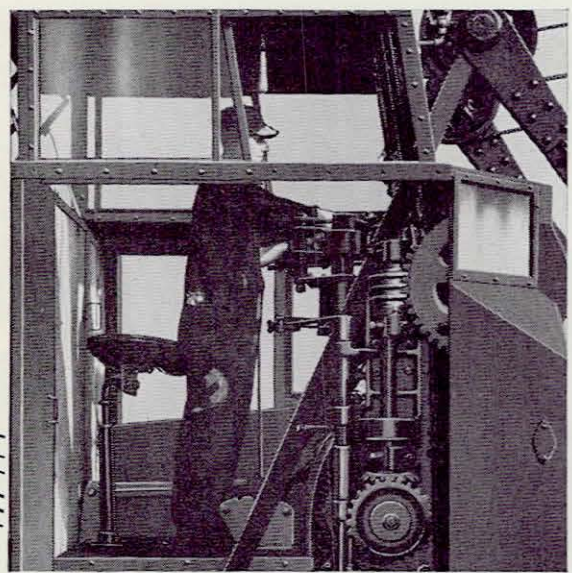
Stand or Sit

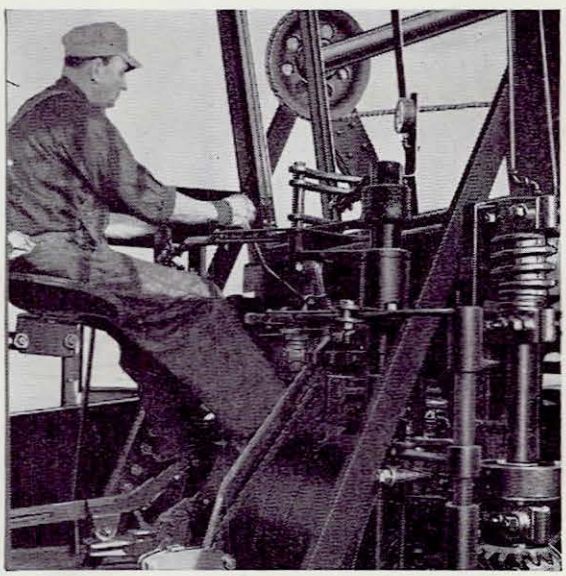
WHILE OPERATING AN INDUSTRIAL BROWNHOIST CRANE

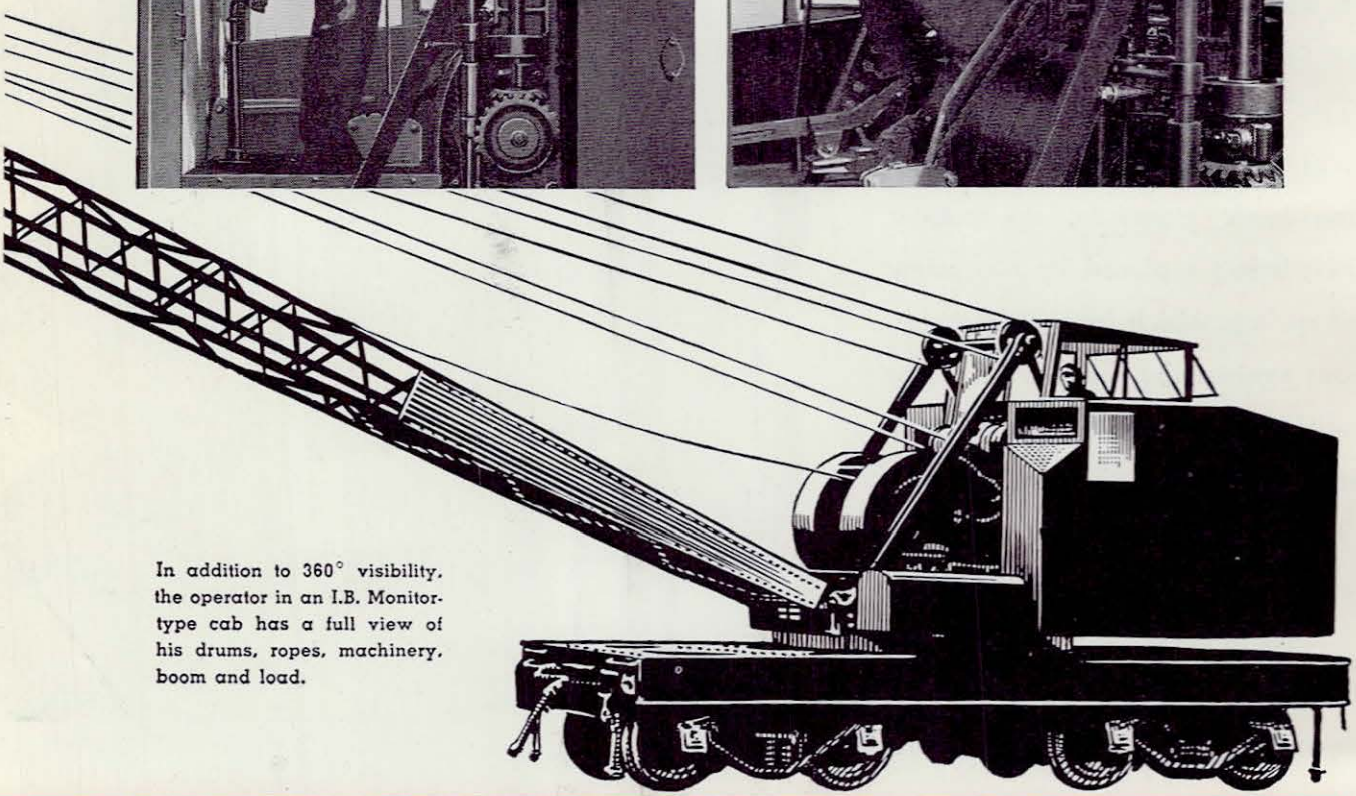
In the 20 ton (No. 4), 25 ton (No. 5) and 30 ton (No. 7) patented Monitor-type cab on Industrial Brownhoist Diesel or gasoline locomotive cranes, controls can be easily operated from both a standing and sitting position, as desired. The adjustable operator's seat can be swung out of the way when not in use.

Operator efficiency is further increased in the Monitor-type cab by an insulated partition between the engine and the operator's platform which reduces motor heat and noise. 360° visibility which allows clear vision in all directions. A blower fan on radiator which helps keep cab cool in summer and a suction fan which helps keep cab warm in winter.

Whether you use magnet, hook or bucket, it will pay you to operate an I.B. Crane. Write today for further facts.







In addition to 360° visibility, the operator in an I.B. Monitor-type cab has a full view of his drums, ropes, machinery, boom and load.

INDUSTRIAL BROWNHOIST BUILDS BETTER CRANES

GENERAL OFFICES: BAY CITY, MICHIGAN • DISTRICT OFFICES: NEW YORK, PHILADELPHIA, PITTSBURGH, CLEVELAND, CHICAGO

A WAR JOB AND A WAUGH JOB

WAR rides the rails . . . rides at top speed despite 11,000 fewer freight locomotives and half a million fewer freight cars than in 1929 * High efficiency and fine equipment is the answer. Not the least important of this equipment are the more than 400,000 Waugh-Gould Draft Gears that day in and day out, month after month, are taking the buffets . . . cushioning impacts, and absorbing jerks and recoil . . . of high speed transport. * Waugh provides protection . . . provides added assurance that ladings arrive safely and on time.

WAUGH EQUIPMENT COMPANY • 420 LEXINGTON AVENUE • NEW YORK, N. Y.

Waugh salutes the railroads with a color film, "Railroads Speed the Freights." Lowell Thomas is the commentator. Should you wish to see or show this film, write on your business letterhead.

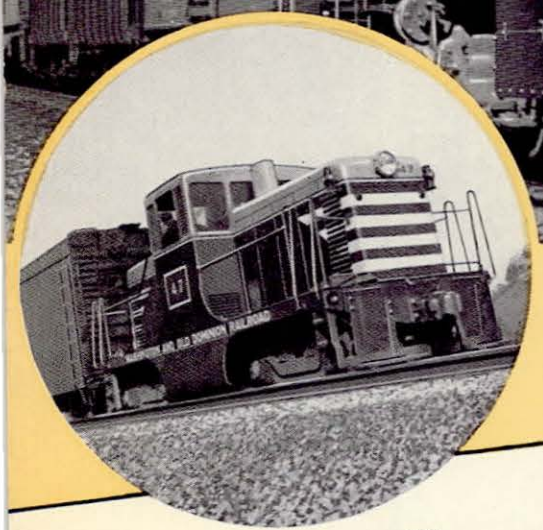
WAUGH ☆ GOULD

Draft Gears

On the Susquehanna

6 ALCO-G.E. DIESEL-ELECTRICS

All day and all night the Susquehanna keeps war goods on the move with this 1000-hp Alco-G.E. diesel-electric—one of six which released 10 steamers for use on other lines.



THE LIGHTWEIGHT CHAMPION
Is a Working War Horse, Too!

This 44-ton diesel-electric performs just like its big brothers—the 660-hp and 1000-hp units. Availability averages 95 per cent. It's a full-fledged road and switching locomotive, ready for work at the push of a button, any time of the day or night. Write for the new booklet describing in detail the performance, design, and time-saving advantages of this punch-packing Lightweight Champion. Ask your G-E representative for Publication GEA-3958.

Until You Can Get All the Locomotives You Need

—it's essential to extract every last ton-mile of service from the motive power now on hand, and that throws the spotlight on maintenance and parts supply. Here are four suggestions that will help you get the most from what you've got:

1. Plan now to obtain parts needed a year from now. More time is required to obtain critical materials and to make parts in plants filled with war work.

2. Order parts early—avoid delays later.

3. Stick to standard parts—more time is required to produce off-standard parts.

4. Accept alternative parts. Frequently a different part will do the job and can be shipped from stock, saving time for everybody.

Use our Unit Exchange Plan to speed wartime maintenance. This plan is designed to minimize your stock of spare parts, accelerate your maintenance program, keep locomotives on the road and out of the shop. Ask your Alco or G-E representative to explain how it operates.

RELEASE 10 STEAMERS...

Speeding war traffic 24 hours a day—conserving man power and materials—cutting costs 52 per cent!

AFTER one year of operation on the New York, Susquehanna & Western, these locomotives continue to hit the rails around-the-clock, taking every kind of service in their stride. As single 1000-hp units, they speed yard switching, transfer service, and local freight. Four are equipped with multiple-unit control, and when two of them are coupled together, they operate as 2000-hp units in road freight service.

Beating Time Boosts Ton-Miles

These diesel-electrics don't lose a minute in daily inspection and refueling. This work is done in 20 minutes of the lunch hour; monthly inspection is completed in the 8 hours required by ICC regulations. While the steam engines are off the road 1½ hours daily for servicing and fire cleaning—and 2 days more per month in the shop for boiler wash and inspection—the Alco-G.E. diesel-electrics are at work speeding war freight on its way.

"The operation and maintenance of this equipment has been beyond our expectation," says A. L. Kline, General Manager in Charge of Operation and Maintenance.

"It didn't take us long to find out these diesel-electrics are gluttons for work. We keep them on the move 24 hours a day.

"And they certainly produce 'more for less'—more switching and road service for less materials, maintenance, and money."

Four of these six Susquehanna 1000-hp jobs are equipped for multiple-unit operation. Here are two of them coupled together, operating as a 2000-hp unit in road freight service.

Alco DIESEL-ELECTRIC

GE

AMERICAN LOCOMOTIVE and GENERAL ELECTRIC

113-6-9580

AJAX

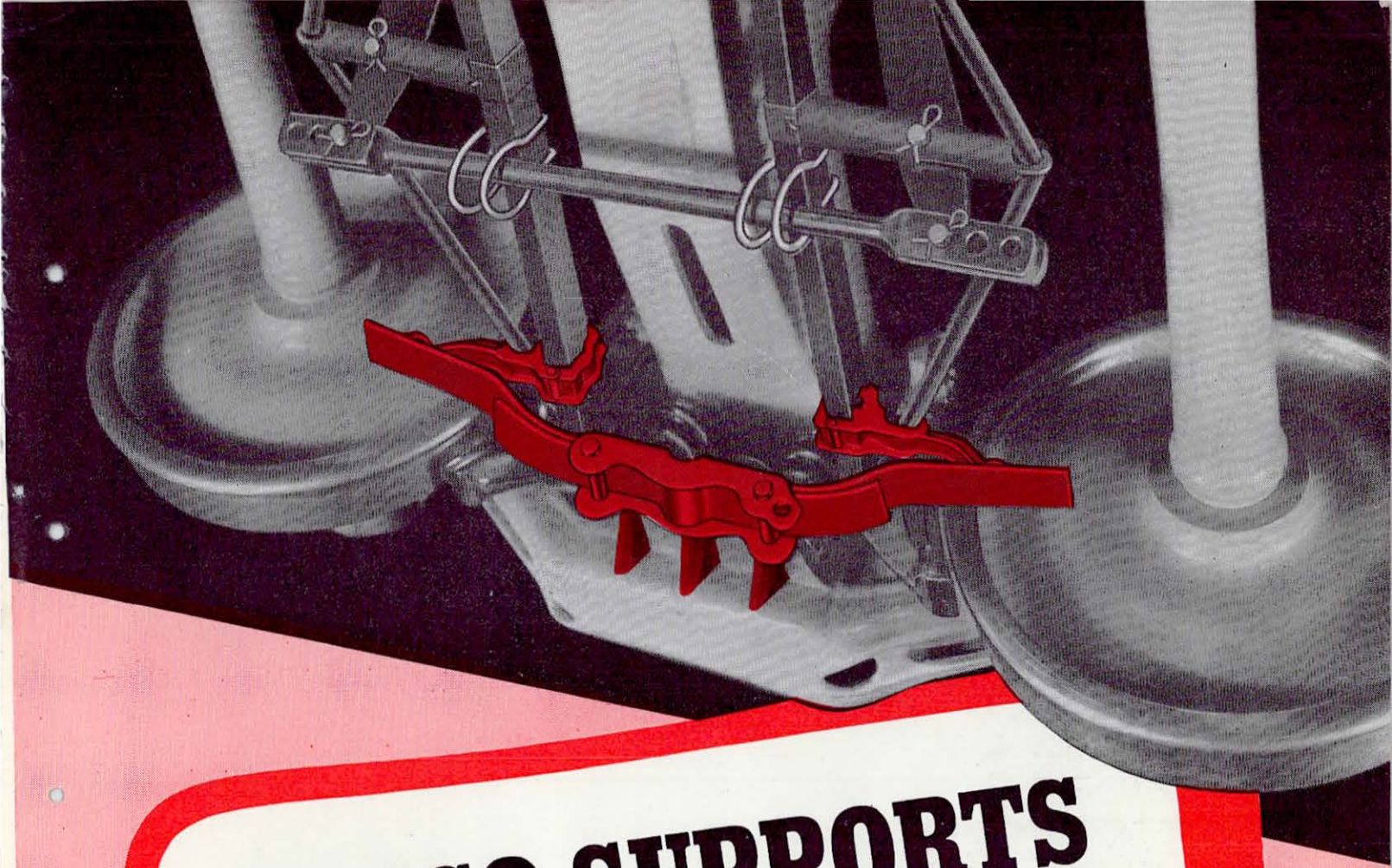
DRINKING CUPS AND DISPENSERS *mean economy and efficiency for railroads—and satisfaction and convenience for passengers*

Save space in cars, cut servicing time, eliminate dispenser troubles; and please patrons who like the crisp, white cleanliness of Ajax Cups and their comforting security in the hand. Ask for specifications, samples and prices.

LOGAN DRINKING CUP CO., Division
68 Prescott St., Worcester, Mass.

PACIFIC COAST ENVELOPE CO., Division
San Francisco, Calif.

Divisions of United States Envelope Company



CRECO SUPPORTS cut brake rigging maintenance costs

Each year, a certain Car Line totals up repair costs covering all items of car maintenance.

About half of the cars have Creco Brake Beam Supports . . . the remainder have ordinary safety guards.

★ ★ ★

The maintenance cost of Creco supported brake rigging was found to be only half of that of brake rigging otherwise supported.

CHICAGO RAILWAY EQUIPMENT CO.
McCormick Building, Chicago

STEPPING STONES TO VICTORY!

EACH landing we make, each enemy position we capture is a stepping stone toward Victory. Each is part of a great chain, leading to Berlin, Rome, and Tokio. But remember, the men who tread this path need backing from all of us at home.

For example, strict conservation of batteries is vitally important . . . and the four simple rules for battery care may be compared to stepping stones. Follow them to make batteries last. Buy to last and save to win.

FIRST STEPPING STONE—Keep adding approved water at regular intervals. Most kinds of local water are safe in an Exide Battery. Ask us if yours is safe.

SECOND STEPPING STONE—Keep the top of the battery and battery container clean and dry at all times. This will assure maximum protection of the inner parts.

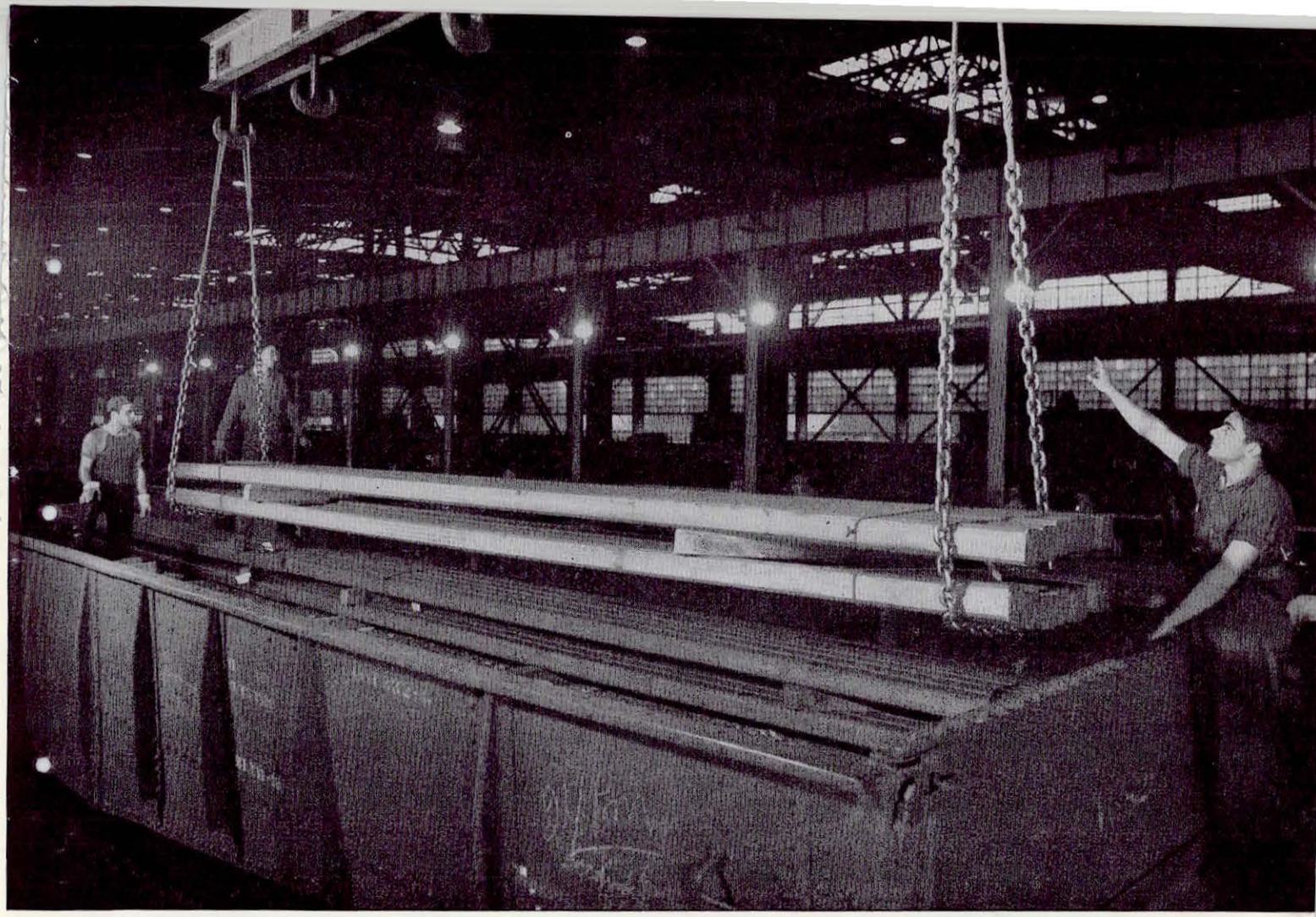
THIRD STEPPING STONE—Keep the battery fully charged—but avoid excessive overcharge. There's always a right way to do any job and a storage battery will last longer when charged at its proper voltage.

FOURTH STEPPING STONE—Keep records of water additions, voltage, and gravity readings. Don't trust your memory. Write down a complete record of your battery's life history. Know what's happening!

If you wish more detailed information, or have a special battery problem, don't hesitate to write to Exide. We want you to get the long-life built into every Exide Battery. Ask for Booklet Form 3814.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

Exide
IRONCLAD
BATTERIES



INLAND PACKAGING AND SHIPPING
Steps Up War Output

Properly packaged and shipped steel steps up war output by avoiding damage and loss of vital tonnage during transit—by making better use of railroad equipment—and, by speeding unloading, storage and distribution at war production plants.

For many years Inland has been studying and applying better methods for packaging and shipping steel. It has been Inland's job to send the right steel, and have it arrive at destination in perfect condition, for economical unloading and immediate use in production.

That is why Inland specialists study each customer's packaging and shipping requirements. They ascertain: delivery service required, rail or truck; methods of unloading; character and capacities of unloading and handling equipment; type of cars or trucks required; size of lifts or packages; storage methods; and, protection needed for material in transit.

Inland experience in packaging and shipping is saving vital steel—helping the railroads use cars to the best advantage—and, aiding war plants meet production schedules.

An Inland expert will gladly help you speed war output by studying your incoming steel packaging, shipping and unloading problems.

A few typical results of Inland Steel packaging and shipping:

A. Change of type of car reduced unloading costs 75%.

B. Improved handling method raised car unloading from 6 to 16 cars in 8 hr.

C. Inland packaging saved 40% of storage space.

SHEETS • STRIP • TIN PLATE • BARS • PLATES • FLOOR PLATE • STRUCTURALS • PILING
RAILS • TRACK ACCESSORIES • REINFORCING BARS

Dedicated to Victory

INLAND STEEL CO.

38 S. Dearborn Street, Chicago • Sales Offices: Milwaukee, Detroit, St. Paul, St. Louis, Kansas City

DAVENPORTS *Pay their Own Way*

DAVENPORT LIGHTER DIESEL SWITCHERS

OFFER THESE
And Many Other
ADVANTAGES

Impressive direct savings over 60-ton steam locomotive operation.

•

High AVAILABILITY for one, two or three eight-hour shifts as desired.

•

Less investment, lessened carrying charges and lower depreciation.

•

Minimum service facilities required.

•

Higher power ratio at slow speeds, quick acceleration and smoother, more sensitive response to controls.

•

Exceptional visibility for maximum safety.

Despite the astronomical cost figures of our global war, ECONOMY continues to be a potent factor in the selection of railroad equipment. This fact alone makes the record of Davenport Lighter Diesel Switchers an impressive one.

Their 100% availability, their responsiveness to control, their quick get away are the means for clearing the switching docket in jig time — a welcome and important operating contribution in this period of traffic pressure. Davenports have released more costly and heavier steamers for duties elsewhere, thereby avoiding the Waste of Over-Power.

It is the determination of many of the railroad executives who have observed Davenport Lighter Diesel Switchers in wartime service to utilize their efficiency and savings in the post war VICTORY era.

Look through 1943 — and beyond. On many of your locations Davenports will deliver an improved standard of switching efficiency (24 hours a day if necessary) while effecting those drastic economies which the long run fiscal policies of ALL railroads must, of necessity, demand.

Davenport locomotives of many types are now going into vital war service for the Army, the Navy and our allies — here and abroad. Our organization is all-out in support of that common cause of world freedom to which the American railroads are making so outstanding a contribution.

Give budget-worthy Davenports your far sighted consideration as you plan for the expanding economy to follow the inevitable VICTORY.

Complete Technical Information Will be Sent on Request

DAVENPORT LOCOMOTIVE WORKS

A Division of Davenport Besler Corporation

D A V E N P O R T , I O W A

The evil little guys who cause so much trouble to those who must maintain the working surfaces of counters, table tops, doors and walls, have two strikes on them, if the surface is covered with Formica.

Formica is harder than marble and very durable. It is not absorbent, and it is chemically inert so it is very hard to stain. It is not brittle and the sharpest kind of a rap will usually not injure it. It may be cigarette proof. The colors are stable and maintain their original appearance over the years.

No wonder so many restaurants, hotels, public buildings, ships and trains make use of Formica surfaces. Watch Formica after the war.

FORMICA

THE FORMICA INSULATION COMPANY • 4641 SPRING GROVE AVENUE • CINCINNATI, OHIO

FORESIGHT

The New York Central's Empire State Expresses, running each way daily between New York, Buffalo, Cleveland and Detroit, concluded their first year of operation on December 7th last. Serving a chain of cities which are bulwarks in our "Arsenal of Democracy", these distinguished trains are capacity-filled every trip. With other trains of "the Stainless Fleet", they are a brilliant promise for railroad transportation in the peace-time future.

is a Railroad Word

AMERICAN RAILROADS are doing a magnificent war-time job. They are moving millions of troops promptly, on short notice. They are carrying an incredible number of civilian passengers. They are hauling unprecedented tonnages of freight, including vast quantities of war material, with promptness and dispatch.

The ability to carry this load is due to foresight. Only because railroad management, with faith in the future, pursued a policy of reconstruction and re-equipment through some of the worst economic years in the nation's history, were the roads able to meet this great test when the time came.

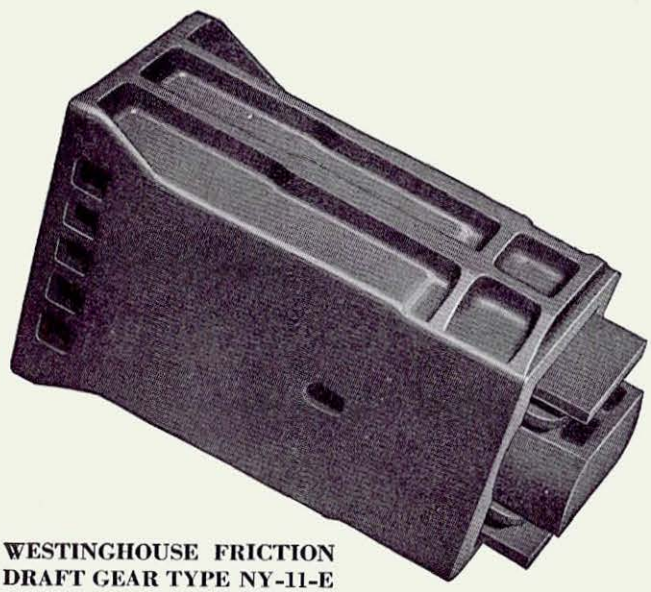
Today, while using their resources to the utmost toward winning the war, the railroads must continue to look forward. They must have the freedom of enterprise and financial strength to continue their program of modernization, to build a greater railway industry for the greater nation to come.

The many railroads which operate Budd-built stainless steel equipment have reported splendid performance in this emergency. They have found that Budd-built trains have the stuff in them that is needed for war-time service. They keep rolling. And what is most important their lighter weight, without sacrifice of strength or safety, lessens the terrific burden which war has put on motive power.

EDWARD G. BUDD MANUFACTURING COMPANY

PHILADELPHIA

IMPACT!



WESTINGHOUSE FRICTION DRAFT GEAR TYPE NY-11-E (Certified A.A.R.)

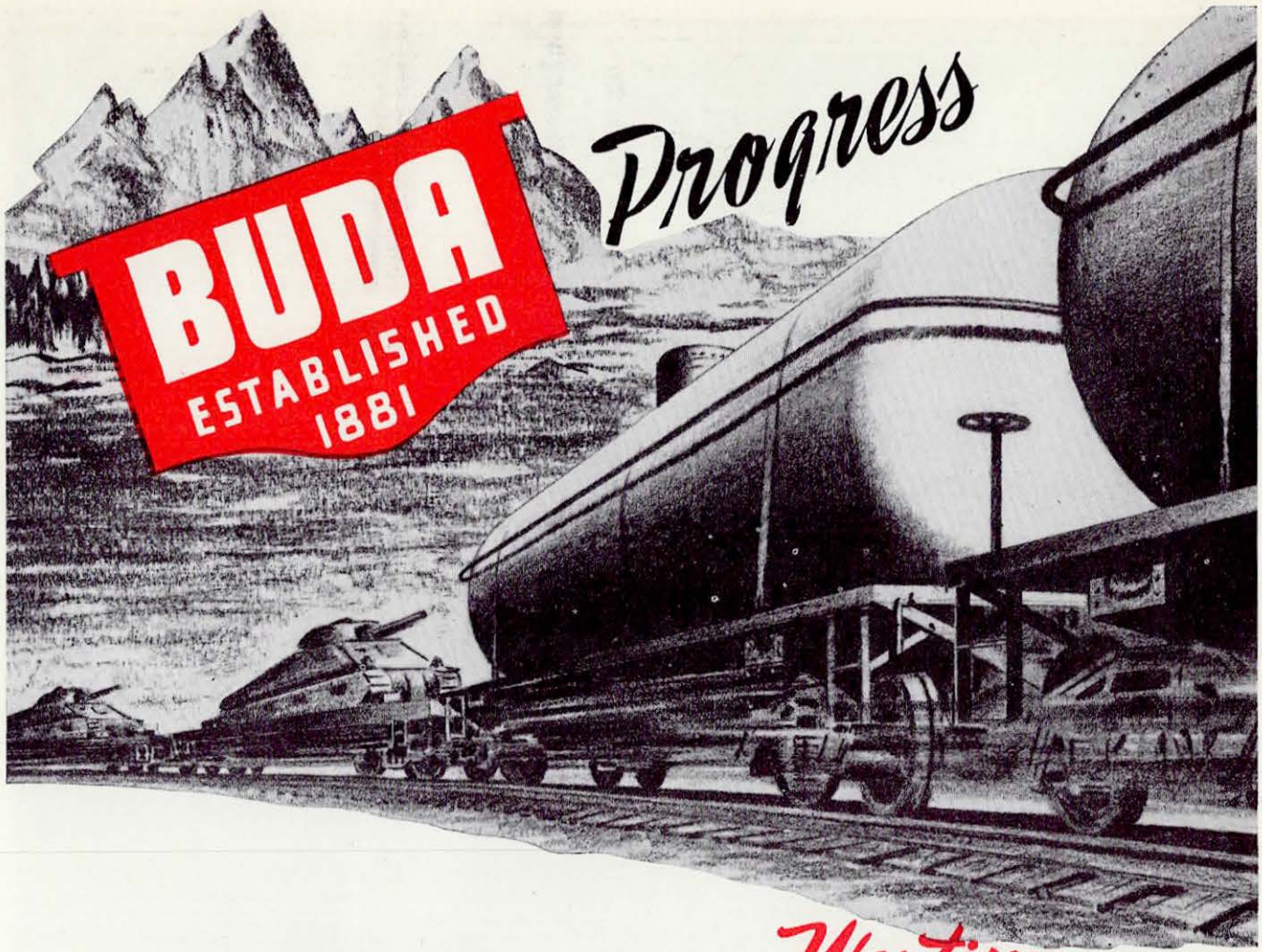
Protection against the impact of starting, stopping and hauling long modern trains requires:

1. A.A.R. Friction Type Draft Gears which keep slack at a minimum.
2. Friction Draft Gears which have high cushioning capacity and low recoil.

WESTINGHOUSE FRICTION DRAFT GEAR TYPE NZ-11-E (Certified A.A.R.)

Because of a constant program of testing, development, and performance studies, Cardwell and Westinghouse Draft Gears continue to fully meet the above requirements as well as the detailed requirements and tests of the A.A.R., without exceeding the 2¾" travel approved by the A.A.R.

CARDWELL WESTINGHOUSE CO., CHICAGO
CANADIAN CARDWELL CO., LTD., MONTREAL



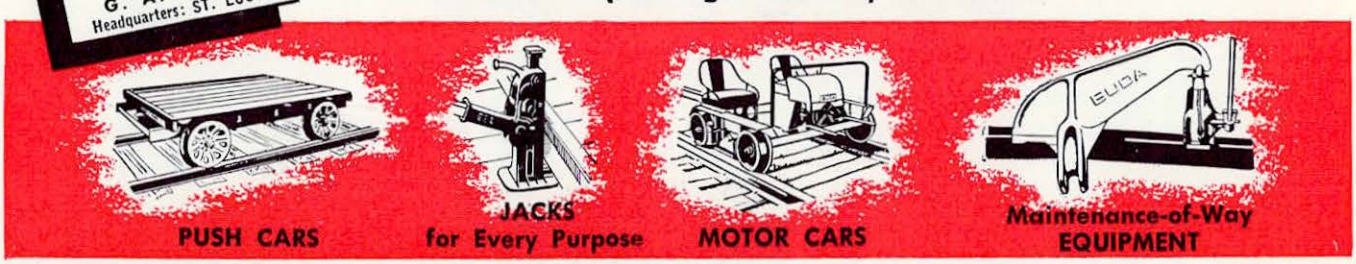
. . . means SERVICE geared to *Wartime* needs!

NO combat equipment in the field is taking more gruelling, steady punishment than the equipment now serving America's railroads. Such punishment must inevitably take its toll; with new equipment difficult or impossible to obtain, repair and service facilities become even more vital to victory.

Thanks to the steady expansion and improvement of BUDA service facilities year after year, today skilled BUDA servicemen stand ready at strategic locations throughout the nation. Stocks of repair parts have been enlarged; parts handling and shipping has been expedited to rush needed repairs to the "fighting front" to keep BUDA equipment at peak wartime efficiency. And—you can be sure that the BUDA service that saves precious hours today will save BUDA users *dollars* in the peacetime days ahead!

THE BUDA COMPANY

HARVEY (Chicago Suburb) ILLINOIS



The origin of a thousand products

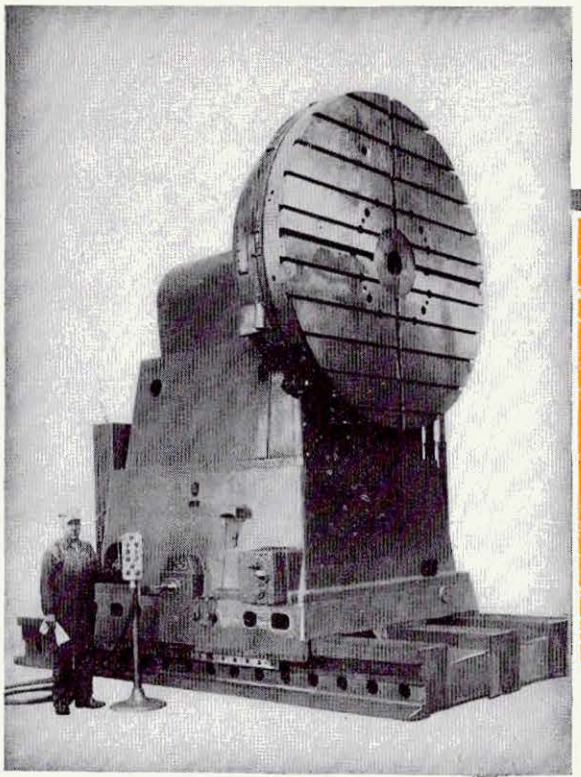
THIS IS ASBESTOS—a magic mineral with the permanence and fire resistance of stone, yet capable of being woven. To these unique properties asbestos owes its versatility. It is an essential ingredient in literally a thousand Johns-Manville products now helping the nation's railroads meet wartime demands.

Asbestos is the keystone of Johns-Manville's service to transportation. Producers of passenger-car insulation and flooring, train-line insulation, boiler lagging, pipe insulation and locomotive packings, Johns-Manville today has but one aim: To make these products in the quantities needed to help win the war.

JM JOHNS-MANVILLE

85 YEARS OF SERVICE TO TRANSPORTATION

Our War Program



For the Defense Front

This large milling machine head weighs 140,000 lb. and is 18 ft. high. It is being manufactured in our plants and is designed for the production of a very important part on a vital piece of artillery.

Cross Section of
UNIVERSAL
Sectional Packing

"Pioneers In The Development of the Light Weight Piston and Combination Sectional Packing."
ESTABLISHED 1872

Save Fuel and Materials

TO meet the demand for shells, guns, planes, tanks and ships requires more and more machines. L.F.M. plants are working day and night turning out important units and equipment which will help speed the day of Victory.

But, that does not mean that we are neglecting the railroads. Without them, all production would be futile.

We realize that conservation of fuel and materials is a very important factor and we are maintaining an ample supply of L.F.M. Light Weight Pistons and Combination Sectional Packing.

Their application reduces frictional wear on the cylinder walls, increases mileage between packing ring renewals and saves power and fuel by eliminating steam leaks in the cylinders.

THE LOCOMOTIVE FINISHED MATERIAL CO.
ATCHISON, KANSAS
NEW YORK CITY CHICAGO, ILLINOIS

LFM LIGHT WEIGHT PISTONS
and Combination Sectional
BULL RING PACKING

QUICK ASSEMBLY . . . special pointed-end inserts easily . . . knurled neck grips the hole . . . clean, accurate threads pull-up fast.

SAFE . . . no protruding heads to trip workers . . . or damage cargo.

SAVE AN OPERATION . . . no need for counter-boring . . . the Water-Tight head seats itself . . . does not protrude.

PREVENTS SPLITTING even near the end of boards . . . the knurled neck meshes like a gear . . . never splits the wood.

LONG SERVICE . . . heads are the thickest where wear is greatest . . . edges are sunken . . . never wear thin . . . seepage is stopped . . . rusting and wood deterioration is minimized.

Annular rings compress the wood fiber . . . form a seep-proof, water-tight seal . . . stops rusting and rotting at bolt holes.
WEATHERTIGHT SEAL

A *Better Bolt* for RAILROAD CONSTRUCTION

The new Oliver Water-Tight Bolt assembles faster, eliminates counter-boring, stops end-splitting in wood construction, prevents seepage and rotting around bolt holes and adds a new "high" in safety and durability to every type of wooden structure.

Use Oliver Water-Tight Bolts wherever a weather sealed, flush fastening is indicated and check the improvement in service life . . . security . . . economy. Use them with confidence . . . . they were designed on the recommendation of Railroad Car Builders . . . and have since been adopted for many types of railroad maintenance work in addition!

Yours is an Industry essential to Victory. Oliver Water-Tight Bolts will help you build better for War-time service and will pay dividends in economy for many years. Oliver Bolts include types for every railroad service. Prompt delivery can still be assured on essential orders.

- ✓ ESPECIALLY DESIGNED upon Railroad Car Builders recommendations.
- ✓ ECONOMICAL . . . low cost to use . . . durable in heaviest service . . . eliminates much rotting, splitting and other maintenance costs of wooden structures.
- ✓ SAFE . . . flush head cannot trip workmen or injure cargo . . . bolt head is heaviest where wear is greatest . . . edges can never wear thin and sharp.
- ✓ EASY TO USE . . . they eliminate counter-boring . . . assemble quickly due to the pointed end that inserts rapidly . . . fast-acting, accurate threads, and knurled neck that grips and holds.
- ✓ BETTER APPEARANCE . . . no protruding heads . . . no depressions to collect dirt.
- ✓ CAREFULLY PACKED . . . to facilitate storage and distribution by your storekeeper.

OLIVER
IRON AND STEEL
Corporation

ALL FOR VICTORY — '43 OLIVER '42

SOUTH TENTH AND MURIEL STREETS, PITTSBURGH, PA.

Gage Rods . . . Screw Spikes . . . Frog and Switch Bolts . . . Track Bolts
Connecting Rod Bolts . . . Structural Bolts . . . Car Builders Specialties

Over $\frac{3}{4}$ *of a* MILLION MILES

THAT IS THE SERVICE RECORD OF THE

JOURNAL LUBRICATOR

Cut-Away View Shows The
STAPAX
In An A.A.R. Type Journal Box

MAINTENANCE free car mileage is bound to climb with effective oil lubrication of journal bearings. This is assured with STAPAX, the lubricator that **stays put.** STAPAX is made of a cylindrical piece of felt formed around steel springs having a spring wire or chain spider built into it to prevent its rolling in the box. The steel springs hold STAPAX in constant contact with the journal. After saturating in oil it is installed by inserting through the opening of the journal box and replaces all waste. STAPAX is in service on U. S. railroads, industrial lines and on many South American roads. Install STAPAX lubricators on your equipment and save oil, vital brass and maintenance. Made for all types of railway car and locomotive journals.

LUBRICATION PRODUCTS COMPANY

5103 DETROIT AVENUE CLEVELAND, OHIO

Dining car on the Olympian
Courtesy the Milwaukee Road

Leading Lines are Planning for '43 with ROSEMARY NAPERY

The amazing efficiency with which our great American railroads are handling record-breaking passenger traffic is equally reflected in their food service. Dining Car Superintendents have learned that they can count upon Tablecraft with its lintless, permanent Basco finish, to maintain their high standards of smart appearance and economy in use. They are planning now to carry on for the year ahead with these outstanding all-American cloths, napkins and tops. For "meals on wheels" it's Tablecraft all the way!* Tablecraft is recommended by and marketed exclusively through wholesale distributors of table napery.

TABLECRAFT by Rosemary — Permanently Finished by the BASCO PROCESS

*Reg. U. S. Pat. Off.

Rosemary INCORPORATED

Dept. 3-B — 40 WORTH ST., NEW YORK CITY

Short Cuts to quicker hauls

AMERICAN railroads now are carrying nearly twice the gross ton-miles of freight they were hauling three years ago . . . and they are breaking all records in passenger traffic. This amazing wartime performance is neither a miracle nor a military secret. It is the result of hard work, skillful coordination, careful maintenance — and a far-sighted engineering program on the part of management that prepared the railroads for today's emergency.

A dominant feature in this long-range planning has been the erection of modern bridges to shorten circuitous routes, eliminate flood hazards, and improve traffic integration. How fortunate it is for our nation's war effort that many of these projects were completed before Pearl Harbor!

American Bridge has built many of these strategic structures. For example, the massive high-level bridge above is the main link in an important cutoff which shortened trackage by 3½ miles and kept it clear of flash floods. The double-deck cantilever bridge shown was erected as part of railroad and highway relocations made necessary by a huge water-power and irrigation project. The bascule bridge replaced an old swing span, providing a wider navigation channel and speeding both rail and river traffic because of a sharp reduction in opening and closing time.

We are glad to have had a part in projects which contribute so greatly to the wartime usefulness of America's railroads. And we look forward to the time of peace when all our resources and facilities will again stand ready to serve the railroads in meeting their post-war tasks and responsibilities.

AMERICAN BRIDGE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.

Baltimore · Boston · Chicago · Cincinnati · Cleveland · Denver · Detroit · Duluth
Minneapolis · New York · Philadelphia · St. Louis

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Export Company, New York

UNITED STATES STEEL

Again, THANKS *Industry*

for our 50th and most important year

IN JANUARY, 1942, we gratefully thanked Industry for its half-century of confidence in Hyatt. That message heralded the beginning of the 50th year of Hyatt Roller Bearings.

Since then . . . with our country in peril of its life . . . American industry has thrilled the Allied world with startling feats of production.

Like soldiers on attack, men of the design boards and production lines swung to the job of pouring out the machines that will win this mechanized war.

Industry called on Hyatt for vital bearing assignments in planes, tanks, ships, guns . . . and in the machines that build them.

Creating bearings for such vital service was more than a responsibility. It was a privilege. It was a command!

Without lost motion the whole productive effort of Hyatt became a single aim . . . to rush the most devastating fighting power possible into the hands of our fighters and their allies.

Under the impetus of our fight for freedom, Hyatt precision production has swelled tremendously. This took place despite the many necessary changes made in designs and sizes, tools and methods . . . all having been accomplished without losing a stride in the race against time.

Working with you . . . for America . . . has given us the chance to be extra proud of our fiftieth year, just completed. It was by far Hyatt's most important year . . . in manufacturing achievement and in contribution to the great cause.

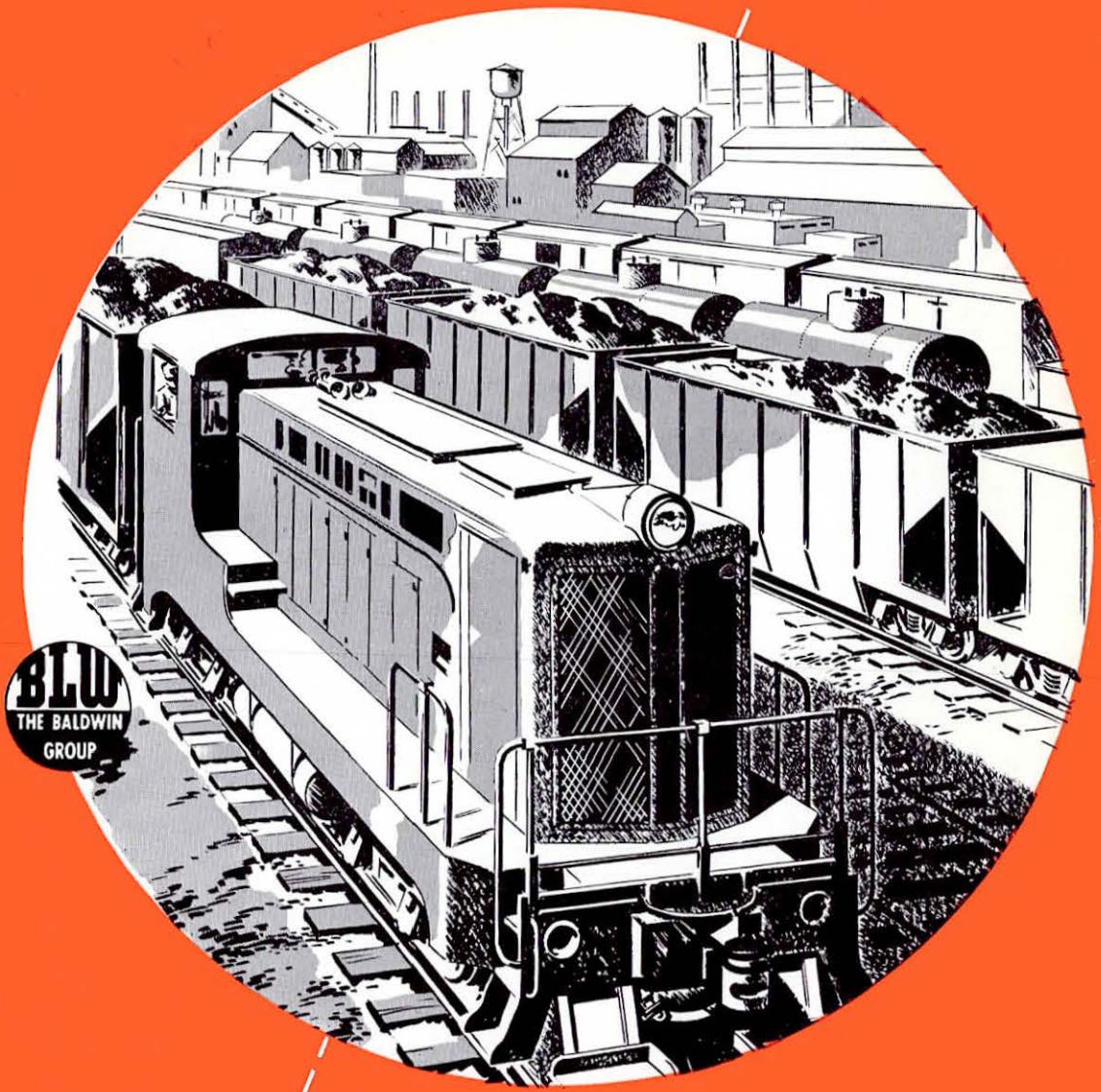
Therefore, for giving us a golden opportunity in our golden year, again we say THANKS, INDUSTRY.

Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.

1892 ☆ 1942
Fifty Fifty... FOR 50 YEARS
INDUSTRY AND HYATT PARTNERS IN MECHANICAL PROGRESS

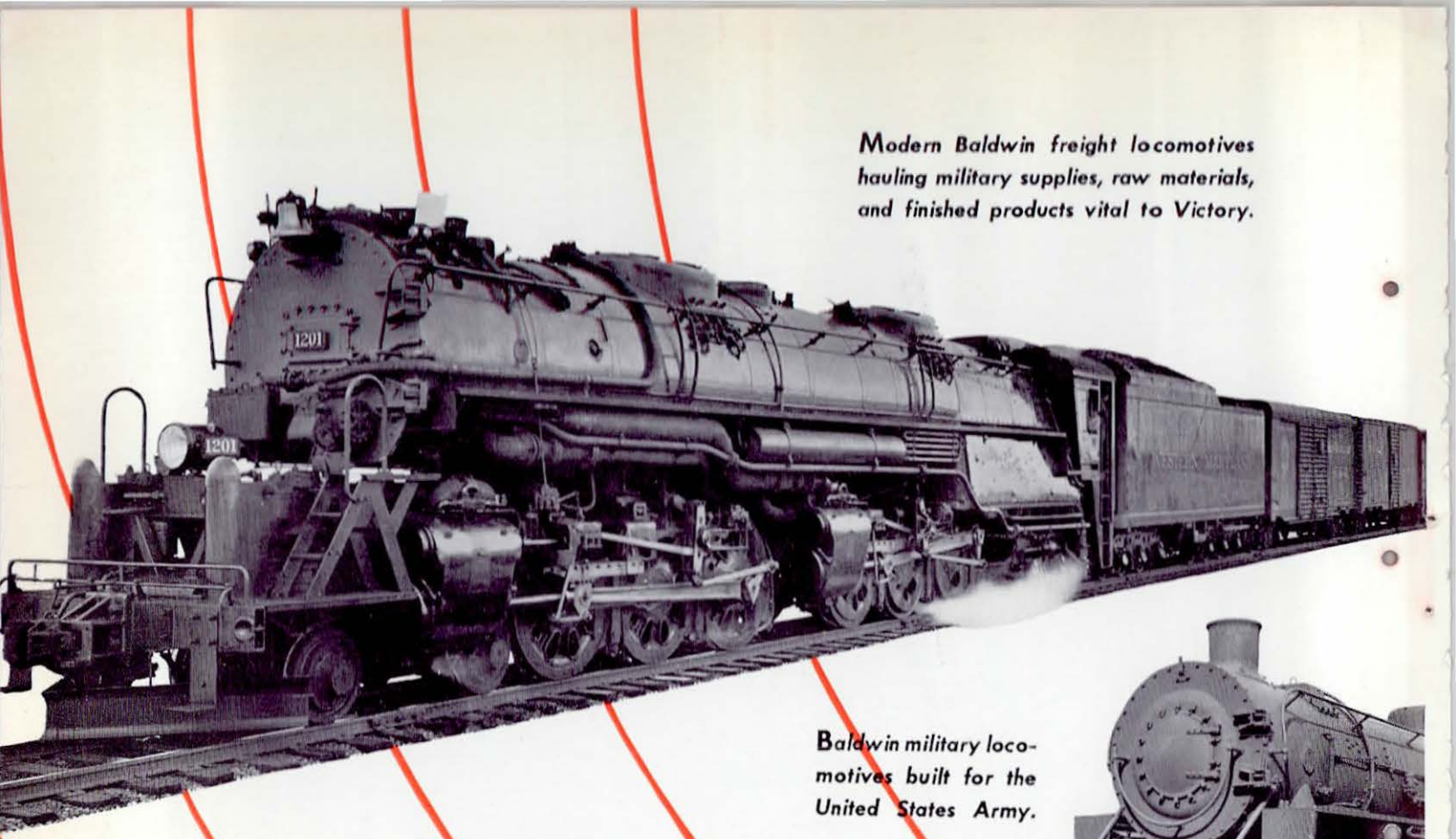
HYATT ROLLER BEARINGS

Baldwin Diesel·Electrics

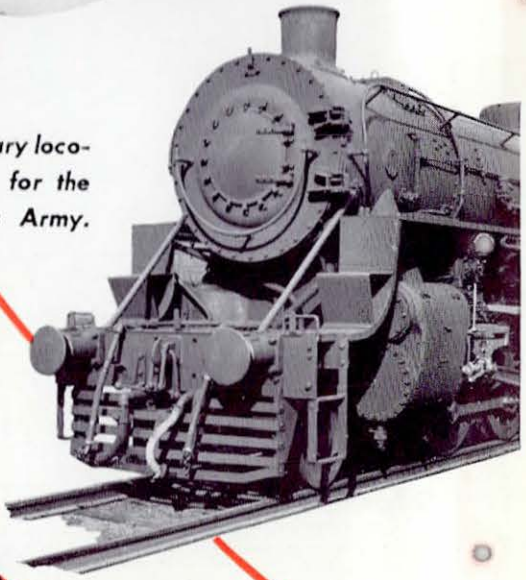


helping America's war effort in yards and terminals from coast to coast

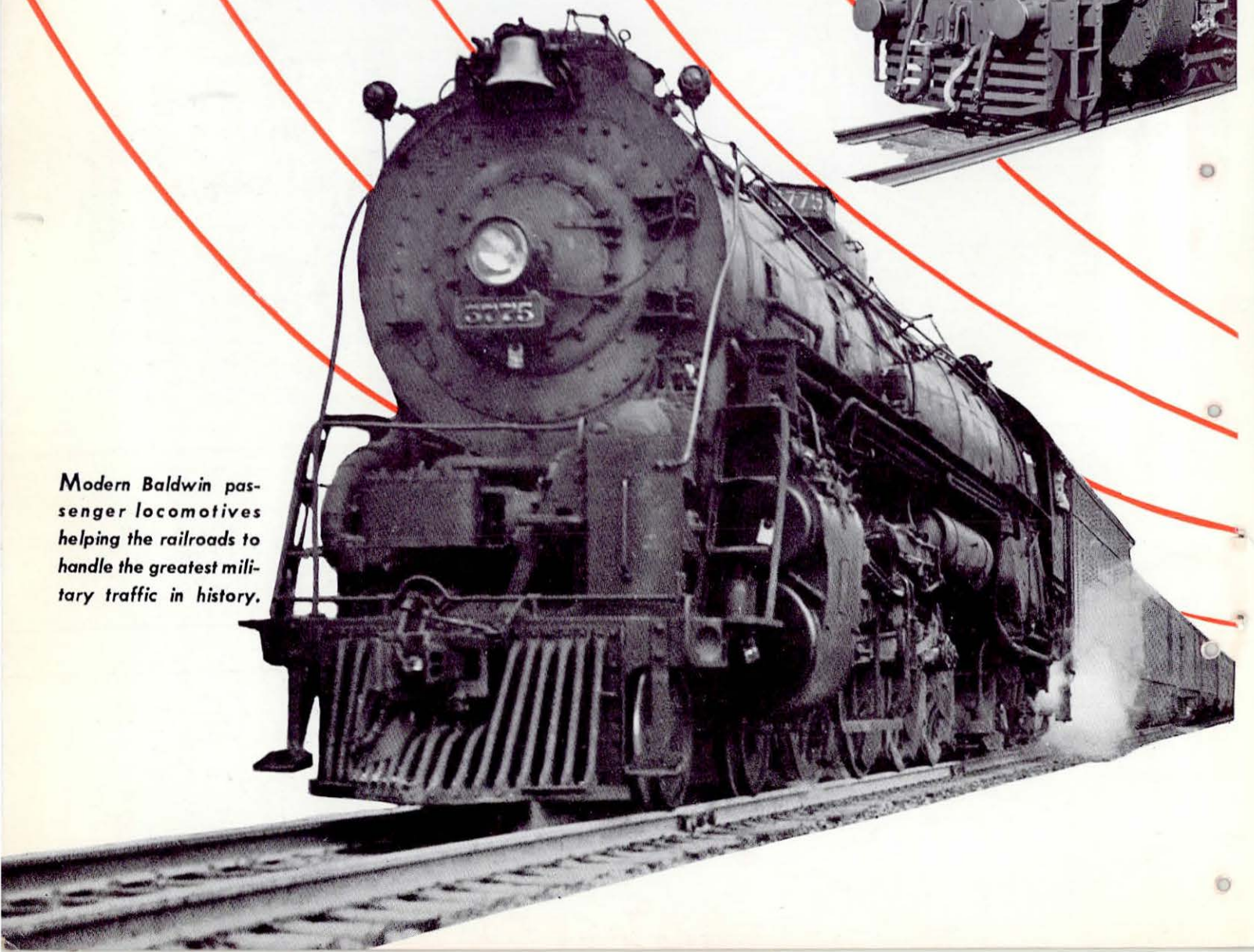
THE
BALDWIN
LOCOMOTIVE WORKS
PHILADELPHIA



Modern Baldwin freight locomotives hauling military supplies, raw materials, and finished products vital to Victory.

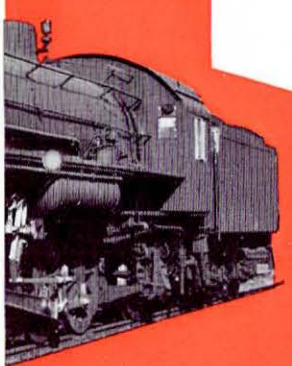


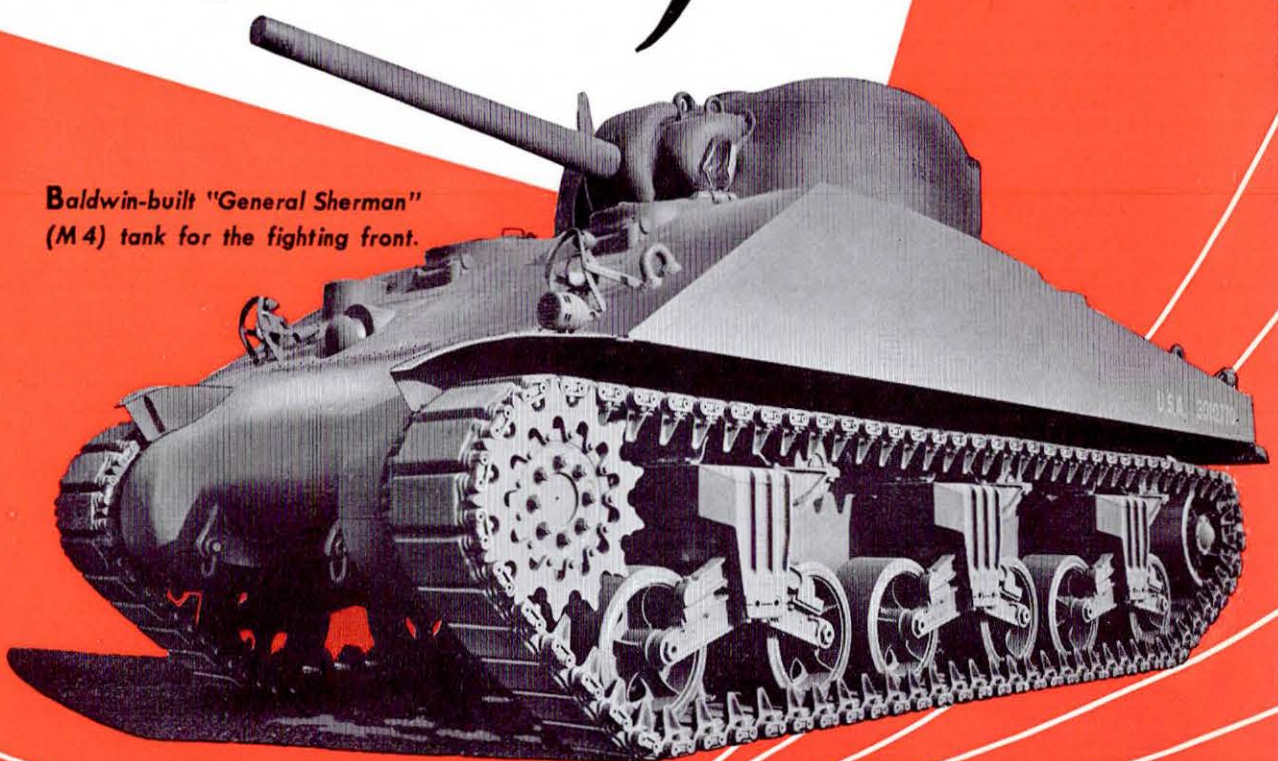
Baldwin military locomotives built for the United States Army.



Modern Baldwin passenger locomotives helping the railroads to handle the greatest military traffic in history.

BALDWIN PRODUCTS FIGHTING FOR *Victory*





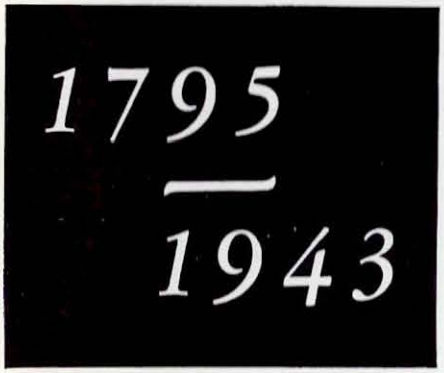
Baldwin-built "General Sherman" (M 4) tank for the fighting front.

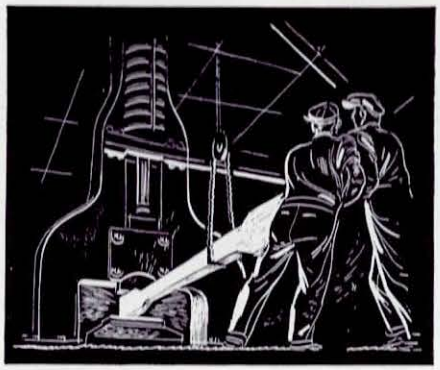
THE BALDWIN GROUP

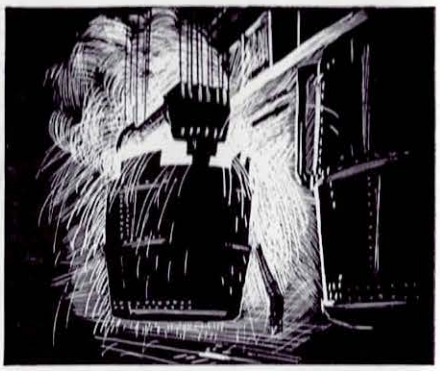
THE **BALDWIN** LOCOMOTIVE WORKS *Philadelphia*

BALDWIN SERVES THE NATION WHICH THE RAILROADS HELPED TO BUILD

Resolved—



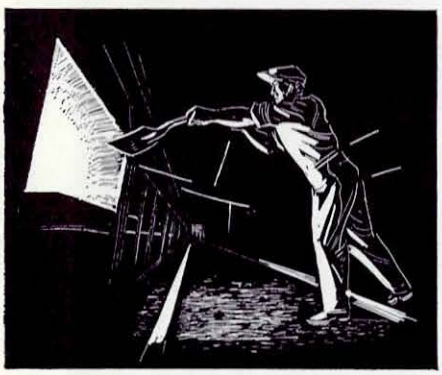


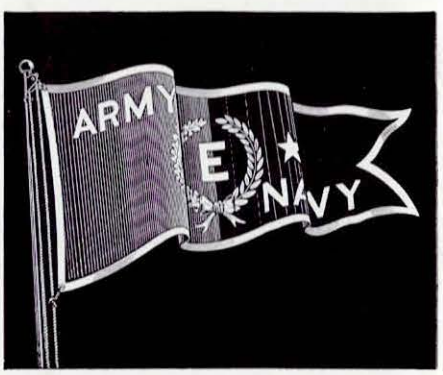


that, to 147 years of Standard history shall be added another year of service to America, to its railroads, and its industries.

that, the skill and long experience of Standard personnel shall be constantly applied in the production of every Standard product.

that, from acid open hearth to finished forging, Standard process control shall protect Standard quality at all times.





that, the constant supervision of materials by Standard's trained metallurgists shall continue to safeguard customer's interests.

that, the reputation for dependability and long service enjoyed by Standard products through the years be increasingly deserved.

that, the high production for war which merited Standard workers the Army-Navy E and subsequent added stars shall be steadily maintained.

that, above all, the energy and resources of all of us at Standard shall be devoted unselfishly in support of the more than two hundred Standard employees now in our country's armed forces, and toward hastening the day of homecoming for them and all of America's sons.

STANDARD STEEL WORKS

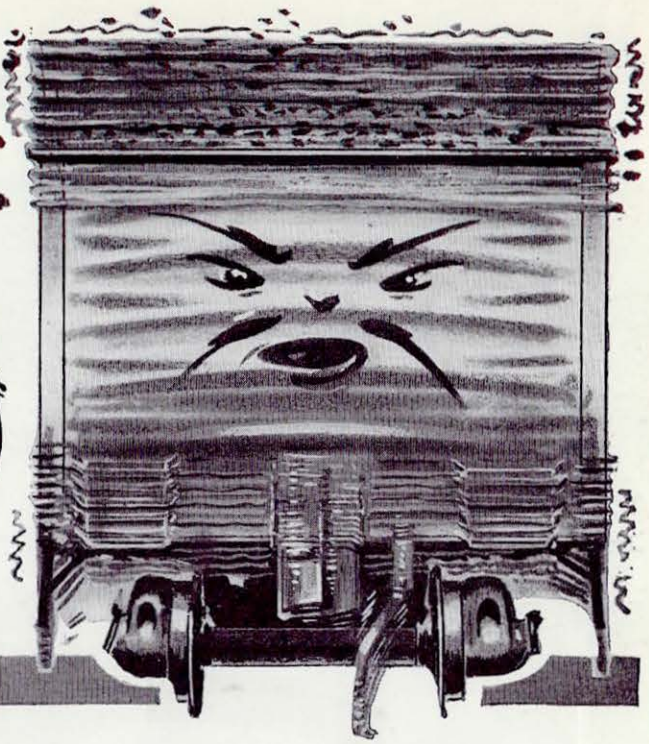
DIVISION OF THE BALDWIN LOCOMOTIVE WORKS

PHILADELPHIA

Stop destructive

BOUNCING

ON ALL TYPES OF FREIGHT CARS



Stop excessive bouncing by installing one Holland Volute Snubber Spring in each Spring Nest. Volute design provides Greater Friction Area.

HOLLAND
Style A6
VOLUTE
FRICTION SPRINGS

All Holland Company Friction Volute Spring Patents as of October 18, 1935, were released to our government.

Uncle Sam uses VOLUTE Springs on many Tanks!

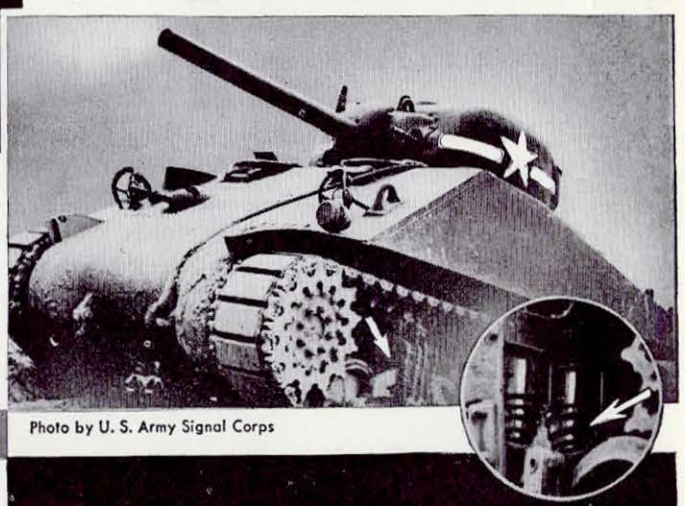


Photo by U. S. Army Signal Corps

The Improved Holla. Snubber Spring

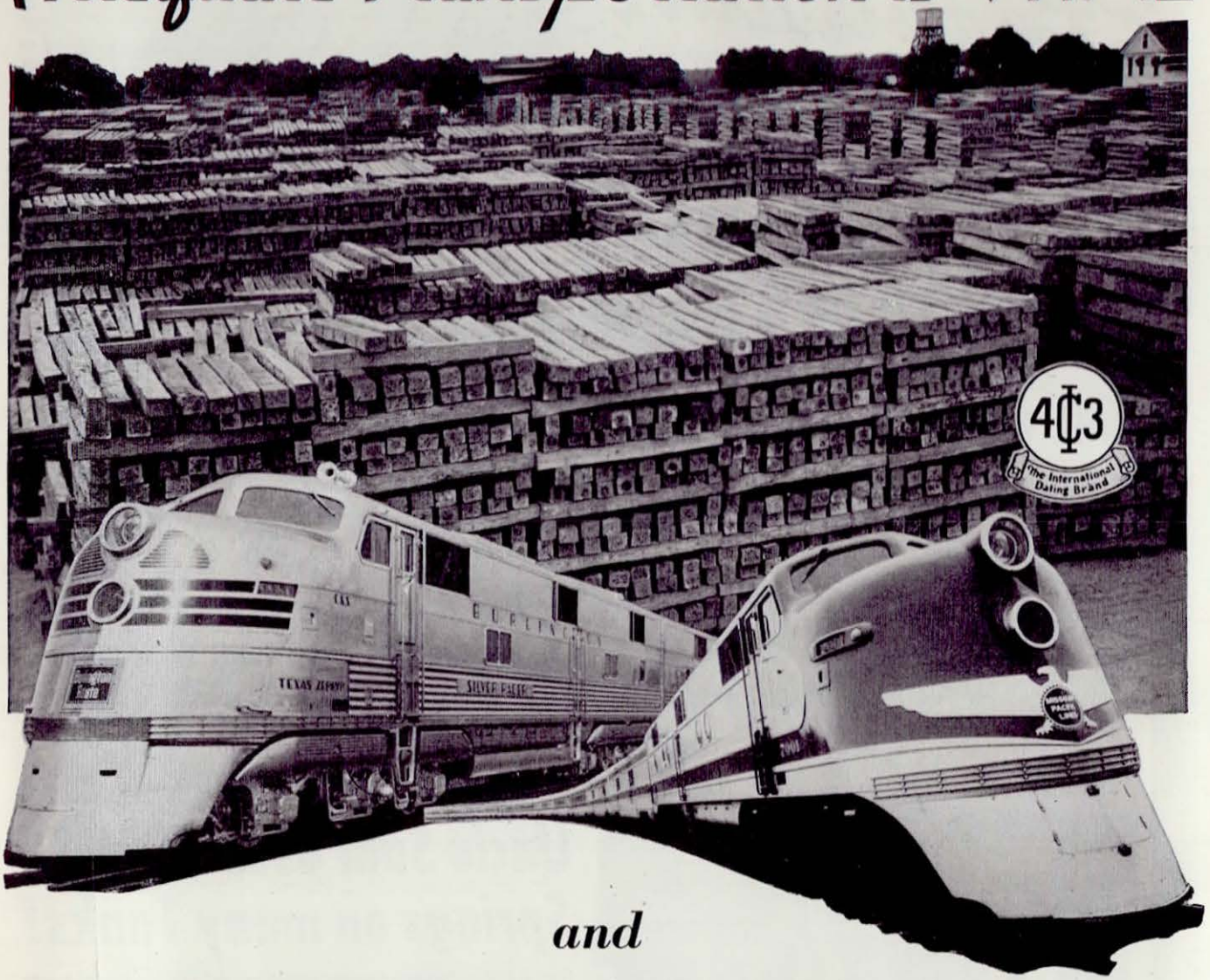
Complete Assembly of Holland Volute Snubber Spring ready to slip into the spring group.

Invest in VICTORY
BUY WAR SAVINGS BONDS

WRITE FOR DETAILS

HOLLAND COMPANY
332 SOUTH MICHIGAN AVENUE, CHICAGO, ILLINOIS

Adequate Transportation is VITAL



and

TRACK MUST SET THE PACE

FREIGHT and passenger progress cannot outstrip the track. In fact, rail transportation involving high speeds and unrestricted schedules with comfort and safety, can be carried on successfully only where the track structure has set the pace. The sound track must be there first and high quality treated ties are a vital factor.

The use of International Creosoted Ties makes certain that the vitally essential elements of track construction will retain their soundness and integrity for many years. International methods assure sound, full-size ties with each tie graded and marked permanently in strict accordance with A.R.E.A. specifications. The entire production and seasoning is supervised carefully to prevent decay, and treatments are made under scientific control using only the highest grade preservatives.

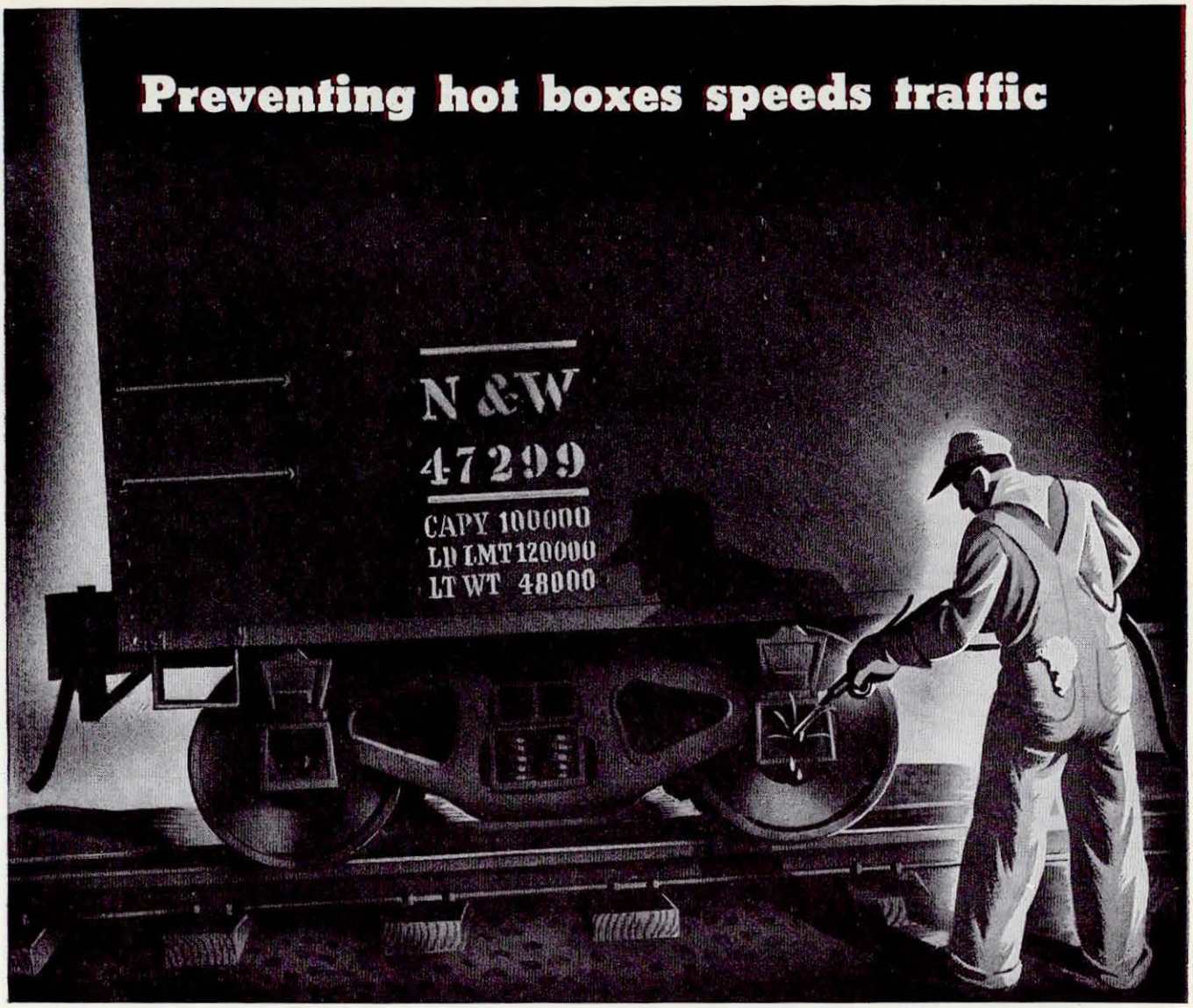
International Ties do much more than improve service and save money—They conserve our National Timber Resources because International Ties are made to provide a very long service life.

INTERNATIONAL CREOSOTING & CONSTRUCTION CO.

PRODUCERS OF HIGH GRADE TREATED TIES, POLES, PILES, ETC.

Galveston — Beaumont — Texarkana

Preventing hot boxes speeds traffic



Information supplied by "Railway Age"

American railroads today are moving a greater freight tonnage with fewer new facilities than ever before. Keeping this vast tonnage moving under existing conditions has taxed their ingenuity and resources to the limit.

Two of the particular problems encountered are delays caused by hot boxes due to inadequate journal lubrication and general tie-ups in yards and terminals.

One railroad has developed a unique method of remedying the hot box situation, and thereby speeding traffic. It consists of adding oil to the journals of freight cars while they are moving through the yard.

One man opens the journal box lids as the cars are being pushed up the hump by the engine. Another man standing close to the track, near the top of the hump, shoots a stream of oil into the journals as the car passes over the hump. A third closes the box lids as the cars run down the hump and into the yards.

The results are, first, assurance of proper lubrication, thereby eliminating hot boxes, and second, reduction in yard delays and tie-ups.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
MOLYBDIC OXIDE BRIQUETTES • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

Climax Mo-lyb-den-um Company
500 Fifth Avenue • New York City

MOLY

TODAY AND THROUGH Countless TOMORROWS

BARBER SIDE BEARINGS

Barber No. 21 Side Bearing

WILL IMPROVE RIDING QUALITIES OF CARS BY REDUCING CAR BODY ROLL, RAIL AND WHEEL FLANGE WEAR

Barber Side Bearings, by reducing car body roll, rail and wheel flange wear and by eliminating side bearing friction, give cars that extra measure of riding safety so absolutely necessary for successfully handling record war tonnage at peak speeds.

Barber Side Bearings for many years have demonstrated their unfailing efficiency and sturdiness on all types of equipment on many leading railroads.

Barber "MONOCAST" Side Bearing

Permits proper adjustment upward or downward, with only slight jacking up of car body. Rollers and wear plates drop-forged of tough, wear-resisting, heat-treated steel. No rivets —housing cast integral with bolster at no extra cost.

Barber No. 21 Side Bearing

Designed for any service. Fool-proof construction—gravity recenters roller—displacement is impossible. Withstands years of severest usage.

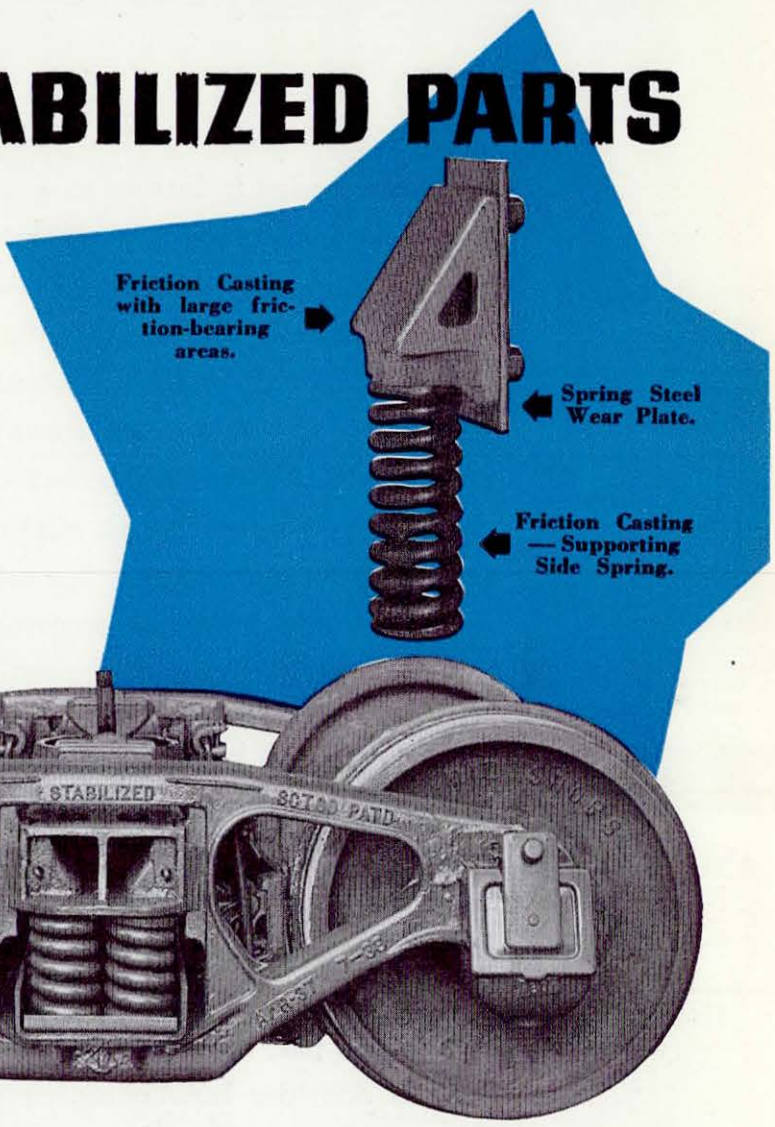
STANDARD CAR TRUCK COMPANY

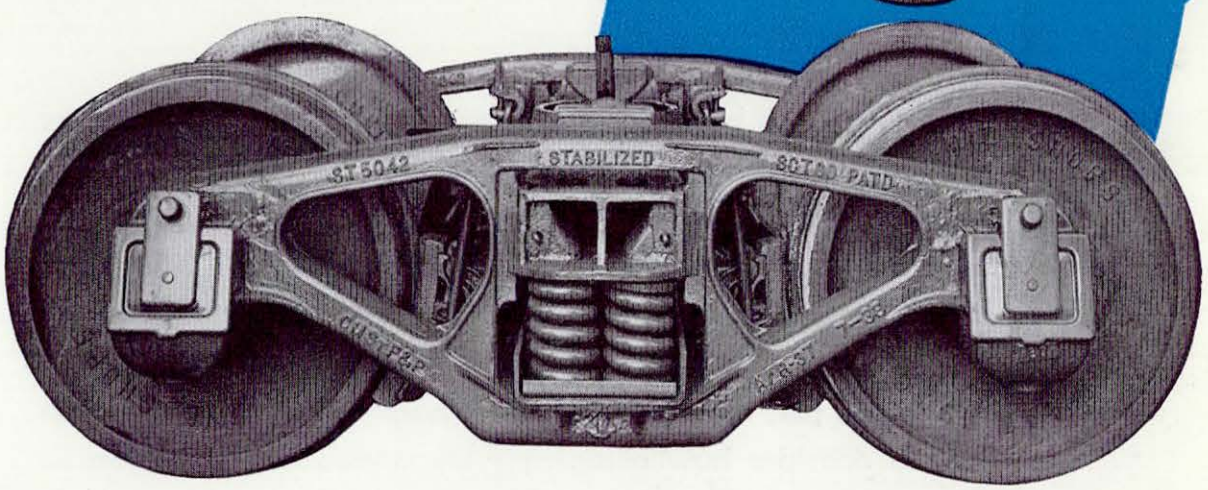
332 SOUTH MICHIGAN AVE. CHICAGO, ILLINOIS

WARTIME SCHEDULES CALL FOR

BARBER STABILIZED PARTS

TO SAFEGUARD AND CONSERVE NOT ONLY CARS AND LADING, BUT RAILS AND ROADBED AS WELL





With Barber-Stabilized Parts built into the trucks, new and rebuilt cars are well equipped to stand up under wartime freight speeds. Excessive spring bouncing is eliminated, so that cars enjoy a safe, smooth ride at all speeds. Damage to cars, lading, rails and roadbed is prevented.

Barber-Stabilizing is inexpensive and permanent —wear from friction is automatically absorbed and lading has the extra protection which the shippers expect.

Over 58,000 Cars with Stabilized Parts Now in Service

STANDARD CAR TRUCK COMPANY

332 SOUTH MICHIGAN AVE. CHICAGO, ILLINOIS

A Tribute Where

THE performance of American Railways during the past year will be recorded in history as a sensational achievement. Never before have so many tons of freight been moved so great a distance. In the month of August the number of revenue passengers carried one mile was the greatest for any August on record. In time of peace these records would be magnificent achievements but in time of war they are more than that, they are vital for they now signify a sustaining power which preserves the very life of the nation—a power which might well be the deciding factor between defeat and victory. No other element of the great fighting, industrial, and economic structure so completely underlies and interlocks all the other elements.

We in America have become so accustomed to watching great achievements eclipsed by still greater ones that unless a success happens to be scored in a field of endeavor where public attention can be focused in a spectacular manner the event and its significance may pass almost unnoticed. Lest this be the fate of what the railway managements and operating forces have accomplished during the past twelve months it is fitting that every American stop to consider how completely the nation depends upon its railroad transportation.

EDGEWATER STEEL COMPANY • PITTSBURGH, PA.

Tribute is Due

The vast majority of raw materials pass over the rails as they move forward step by step through the processes ending in the finished product, whether that product be a Flying Fortress over the Solomons, a destroyer protecting a convoy, a "General Sherman" in Egypt, or the necessities of life for the civilian army which stands united behind the fighting forces. The men and women of the railroads have indeed demonstrated to the world that private management can rally a supreme effort without the lash of the dictator or governmental decree, an effort which can have but one result — Final Victory.

This great feat of heroic proportions in the field of industry deserves the highest tribute of honor and praise and Edgewater Steel Company welcomes this opportunity to render that tribute where it is due. A sense of complete security for the future of Democracy comes with the assuring knowledge that American Railways have met a great crisis, not by faltering and indecision, but by exceeding peacetime records of performance.

ATLANTA BALTIMORE BOSTON CHICAGO CLEVELAND KANSAS CITY
LOUISVILLE NEW YORK PHILADELPHIA ST. LOUIS ST. PAUL
SAN FRANCISCO SEATTLE TULSA WASHINGTON

Case History No. 88

American Car and Foundry Company — long a principal source of supply to railroads — doesn't have to advertise today to sell its products. But there has been no let-down in ACF business paper advertising. It's just as important today as it ever was — serving not only the company but the railroads and the country.

Business Paper Advertising

"No Let-Down in Our Advertising"

AMERICAN CAR AND FOUNDRY COMPANY

Continues to Use Business Paper Advertising, as

An Information Service to the Railroads

GOOD BUSINESS PAPERS BUILD BETTER

This message is reprinted from the December 1, 1942, issue of *Sales Management* . . . one of a survey series showing that good advertising in good business papers helps lick wartime sales problems most companies face. This series is sponsored by 18 business publications including the Simmons-Boardman railway papers.

Helps Lick Sales Problems of TODAY!

J. M. REIBEL
Advertising Manager
American Car and Foundry Company

Our Problem

The increased demand for our products and government regulation of our production leave us problem-free as far as disposal of our output of railroad cars of all types is concerned. We have never felt, however, that this condition relieved us of the necessity of advertising.

We can make and sell so much — which is less than the demand. Consequently, our position must be explained — also our policy of all-out cooperation must be kept before the industry. The railroads must be reminded, regularly, that every facility in our power is harnessed to the job of helping them speed up the vital flow of munitions.

Then, too, we have an obligation to extend our moral as well as physical support to the railroads. They are doing a real job today; never have they been called upon to do so much with so little.

Our advertising, we know, is not only maintaining ACF prestige, but it is helping the railroads — and in helping them, it is contributing to Victory.

Why We Use Business Papers

The people who are interested in our messages are readers of business papers. So business papers are the logical medium for telling them what we feel we should tell them, at regular intervals. We have always used business papers. Even though there is no need for product copy as such, we recognize that business papers are as important today in our industrial relations as they ever were — in fact, more important.

Results To Date

The yardstick that applies to regular product copy cannot be used on institutional copy of this sort. That does not mean that you can't gauge the efficacy of this advertising. Usually there are plenty of indications to tell whether a campaign is worth the effort and the money. In our case, we have no doubt that the ACF advertising in business papers has been tremendously successful — a conclusion that was clinched long ago by the volume and tone of letters and comment from railroad executives. Our appropriation has not been cut. There is no indication that it will be.

J. M. Reibel

BUSINESS

Railway Age

Railway Mechanical Engineer

Railway Engineering and Maintenance

Railway Signaling

Timely help

FOR ALL 4 MAINTENANCE JOBS

Westinghouse

Time saver for American Railroads

1

RENEWAL PARTS

17 Warehouses located throughout the country carry an adequate stock of frequently used electrical renewal parts.

2

PLANTS FOR MAJOR REPAIRS NEAR ALL RAIL CENTERS

34 completely equipped manufacturing and repair plants are ready to speed major electrical repairs.

3

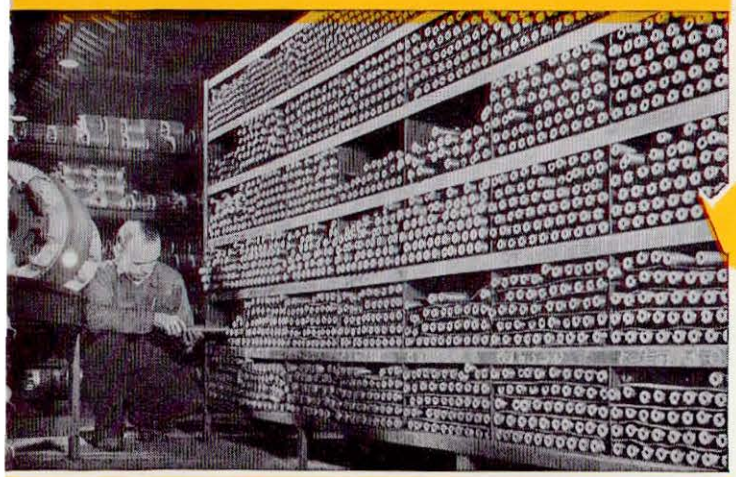
WELDING EQUIPMENT FOR EVERY RAILROAD JOB

This includes a-c and d-c welders, both portable and stationary; engine-driven welders; and equipment for semiautomatic process welding.

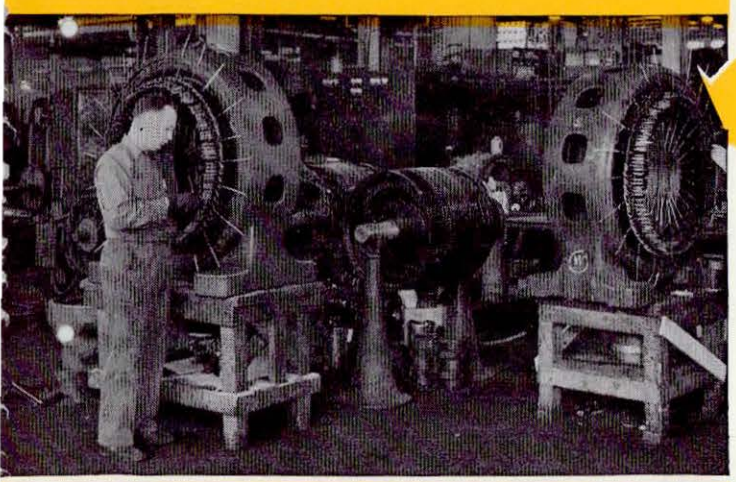
4

HELP FOR MAINTENANCE MEN

Valuable information from Westinghouse experiences, on how to keep electrical equipment on the job. Mail the coupon.

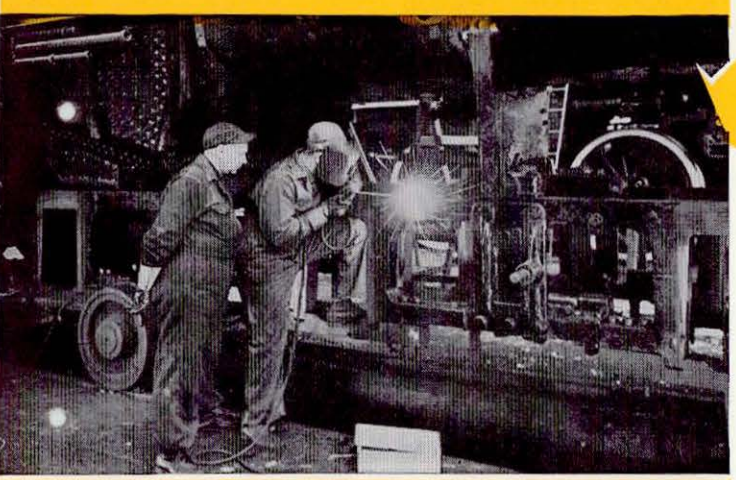


17 WAREHOUSES. Westinghouse has established 17 warehouses where you can obtain electrical renewal parts quickly. Stocks on hand include those parts normally subjected to wear or burning such as contact tips, shunts, arc chutes, operating coils, armature and field coils, bearings, etc. Be sure your own stock of renewal parts is adequate to meet emergencies. Before it runs low, order direct from our local office.



34 REPAIR PLANTS. Westinghouse has established 34 district manufacturing and repair plants. Each of these plants is equipped to repair, remodel or recondition your electrical apparatus. This includes rewinding motors, generators and transformers; replacing or building up worn parts such as bearings, commutators and current collectors.

More than 4,000 employes are now serving our customers from these 34 Westinghouse district plants alone. To save time on repair, call our local office.



THE RUSH WELDING JOBS in the shop, yard and on the tracks can be done faster and better with Westinghouse welding equipment. Whether it's bridge repair, rail end hardening, car repair, parts fabrication, or locomotive maintenance, there's a Westinghouse welder to fit the job.

In addition Westinghouse makes a complete line of welding rods, each developed especially for the kind of metal to be welded.

Welding is typical of the many Westinghouse products that will help railroads accomplish their wartime responsibility of moving men and materials—quickly and safely.

SAVE TIME WITH BETTER MAINTENANCE. One of the most important single group of workers you have is your maintenance crew. These men deserve all the help you can give them.

Westinghouse has prepared a valuable book on the care and maintenance of electrical equipment. Pocket-size, it gives helpful hints on the care of motors, bearing lubrication and maintenance, tips on general inspection and many other valuable suggestions on how to keep your electrical equipment on the job. "Maintenance Hints" is free. Each of your maintenance men should have a copy.

When you request Maintenance Hints, you will automatically receive Maintenance News, issued periodically to give the latest maintenance information.

J-95079

Westinghouse Electric & Mfg. Co.,
Dept. 7-N, E. Pittsburgh, Pa.

Please send Maintenance Hints, Vol. I and II., and Maintenance News to:

Name_____

Company_____

Address_____

City_____ State_____

Requested by_____ Title_____

If more than one of your maintenance men should have this book, write their names on your letterhead. We'll be glad to send them copies.

LEAD SUPPLY HELD AMPLE
WASHINGTON—In spite of heavy wartime demands on the nation's lead supply, no shortage of this important metal is in sight. Since lead is indispensible to the manufacture of storage batteries, this is good news for the many industries that depend on lead-acid batteries for power—particularly in the fields of transportation, communication, and materials handling. New storage batteries can be purchased by firms engaged directly or indirectly in war work.

You can still get the same high quality

GOULD KATHANODE

for car lighting and air conditioning

THE LEAD that goes into today's Gould batteries is the same lead that has always been used—chemically pure and unadulterated. The battery you buy will give the same top performance, the same long life you have learned to expect from Gould.

But before you buy a new battery, make sure that you are getting full service from your present equipment. Remember that Gould Kathanode, the battery with the sensational spun glass construction introduced by Gould to American industry, *lasts twice as long* as ordinary batteries lacking this feature. Proper care and attention will insure your getting the extra value that is built into Gould batteries.

ABOUT RATINGS— Goulds are rated conservatively. They will *equal* or *exceed* in capacity any battery of comparable size and cell structure. Buy on proven performance and you will buy Gould!

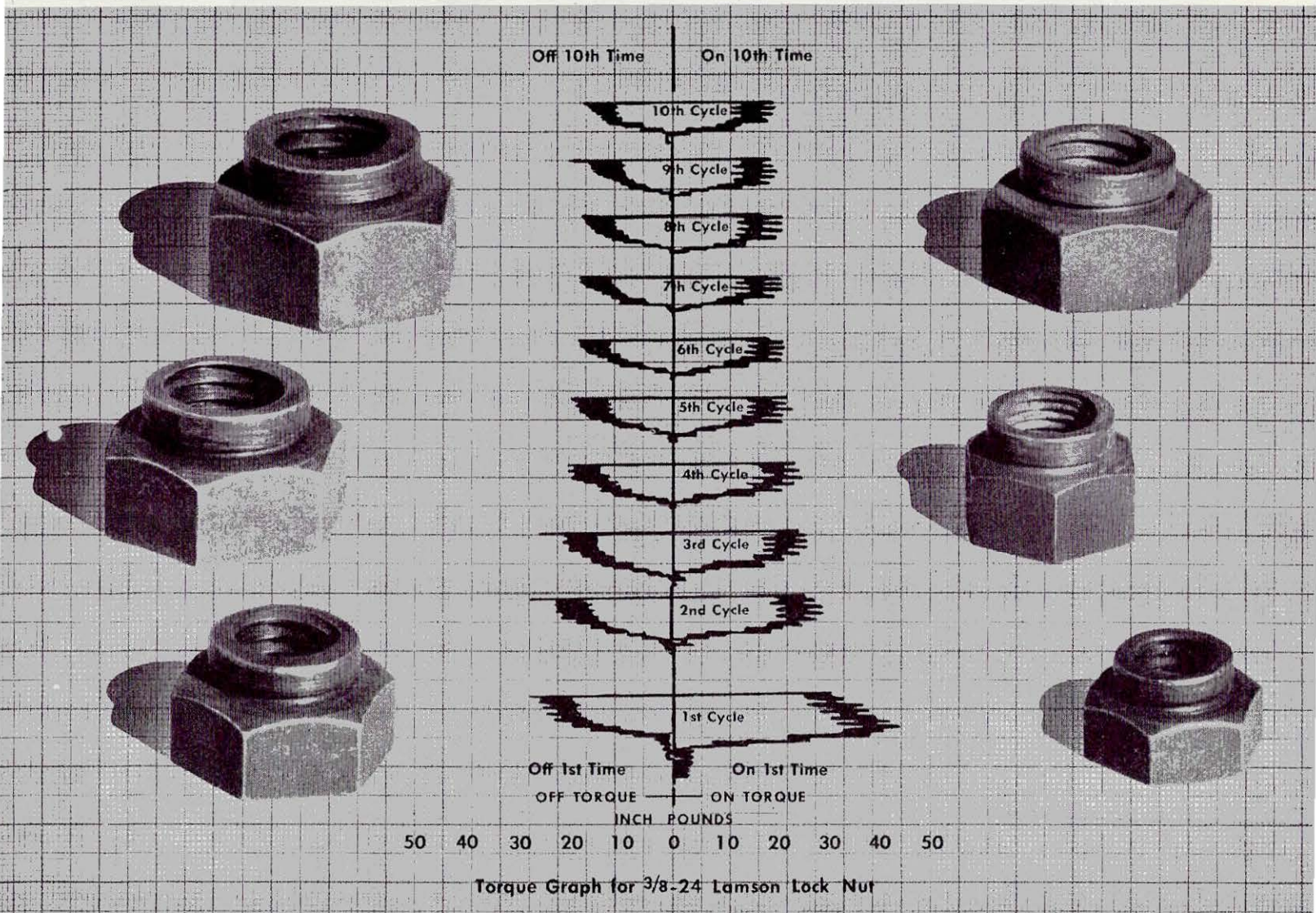
FREE HELP ON BATTERY PROBLEMS—Let the Gould Service Man give you competent, disinterested advice and help on how to make your battery deliver full service. No charge, no obligation. Simply write Gould Storage Battery Corp., Depew, N. Y. Ask for free descriptive literature on any type of industrial installation.

GOULD **THE BATTERY PICKED BY ENGINEERS**

THIS IS A "PICTURE" OF LAMSON LOCK NUT*

*U.S. PATENT NO. 2255286

Performance



Torque Graph for 3/8-24 Lamson Lock Nut

ABOVE—each cycle of "on" or "off" represents a minimum of *eight full turns*

● It is one thing to make an unsupported claim and quite another to back it up—so let's look at a graphic illustration of the performance of Lamson Lock Nuts* after we have made these claims. We say the Lamson Lock Nut* clamps onto the thread of a bolt and *stays right there* until removed with a wrench. It does this because after forming the nut complete with thread, it is then slightly deformed on opposite sides of the collar which surmounts or crowns the nut proper, but which is an *integral threaded* part of the nut itself. The Lamson Lock Nut* is heat treated to impart spring action to the collar. The spring tension of the collar of the nut clamps the nut on the bolt like a vise, until purposely removed with a wrench. Removing the Lamson Lock Nut* does not damage the threads of either bolt or nut, hence the nut can be used over again as shown by the above graph. In the most severe kinds of tests, in the laboratory and in the field, the Lamson Lock Nut* is making good. And now verify our claims by asking for samples for any tests you choose to make, under any conditions you think are fair—*to you.*

★ Unless otherwise specified Lamson Lock Nuts* are supplied treated with a non-seizing, rust resisting black finish.

●

THE LAMSON & SESSIONS COMPANY • 1971 West 85th Street • Cleveland, Ohio

Plants at Cleveland and Kent, Ohio; Chicago and Birmingham

LAMSON & SESSIONS

● BOLTS • • NUTS • • COTTERS • • CAP SCREWS • • SPECIALS

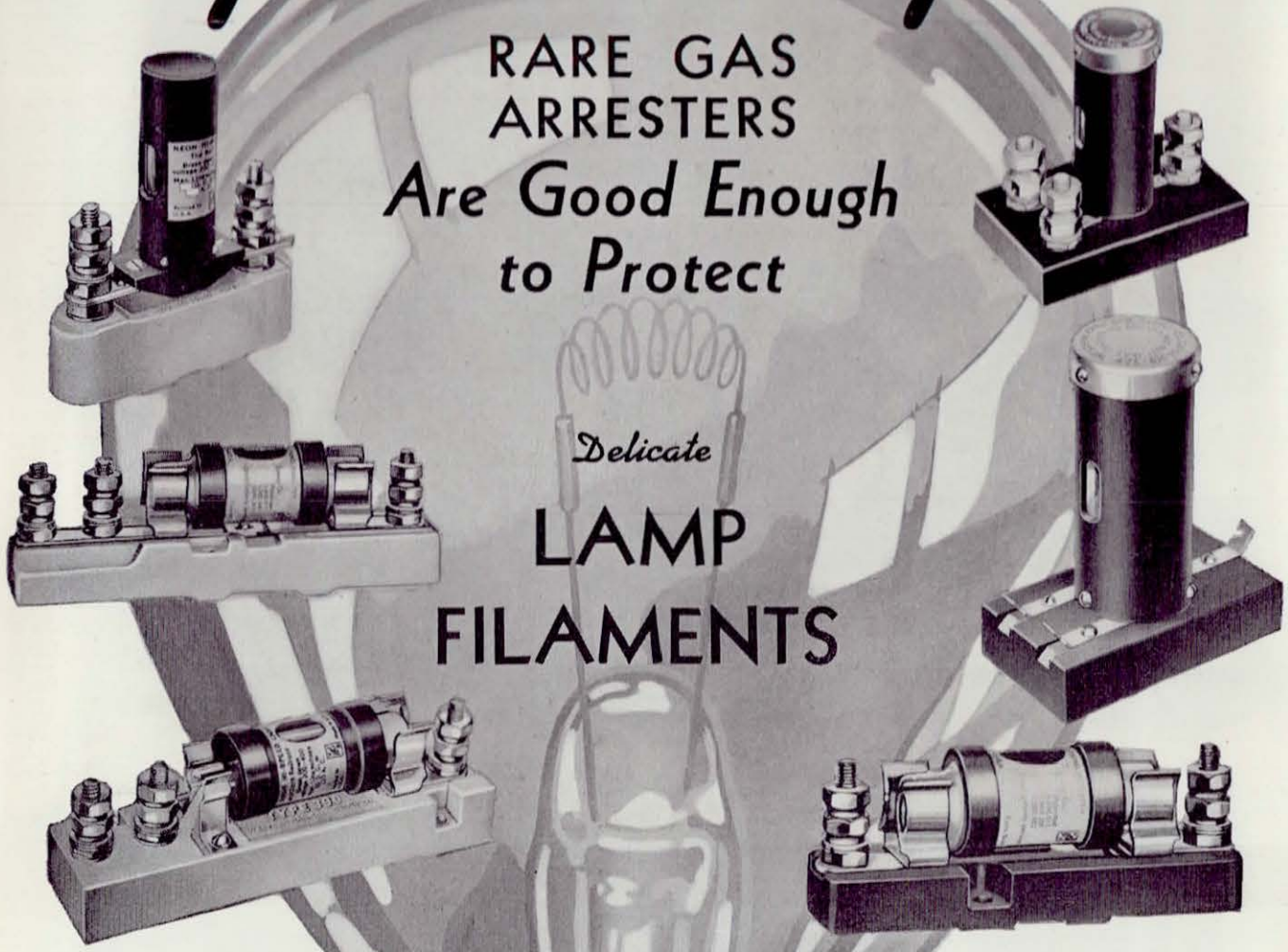
Your Jobber Stocks the Lamson Line

Engineers Agree—

RARE GAS
ARRESTERS
Are Good Enough
to Protect

Delicate

LAMP
FILAMENTS



Then surely they must be good enough to protect all other SIGNAL EQUIPMENT

Including Code Following Track Relays

30 years experience and several million
Arresters in service stand back of every
WRRSCO RARE GAS ARRESTER

WESTERN RAILROAD SUPPLY CO.

2330-2360 S. Ashland Avenue — Chicago, Illinois

WHAT IS IT that has made America confident of Victory through all the tough going since Pearl Harbor? . . . It is *faith* in our heritage of accomplishment during a century and a half of freedom.

American Railroads are giving a great demonstration of this spirit through their magnificent and indispensable contribution to the war effort. They are foremost among our potential assets and their effectiveness must be maintained.

This Company is proud of its record of more than fifty years of cooperation with the railroads in the solution of many problems, and of its present effort in converting its facilities and experience to the production of precision equipment for our armed forces.

THE SAFETY CAR HEATING and LIGHTING COMPANY, INC.

NEW YORK - CHICAGO - SAN FRANCISCO - PHILADELPHIA - BOSTON - ST. LOUIS - MONTREAL

STREAMLINE GLASS FOR STREAMLINERS

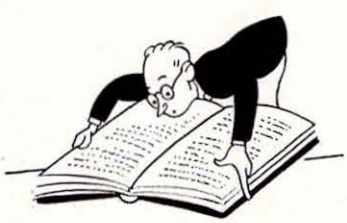
PRESSED PRISM PLATE GLASS CO.

General Office: Morgantown, West Virginia

7,000,000

Soldiers. Already in 1942, the railroads have moved 7,000,000 troops! We think it's a low estimate. But even if it isn't, think how much more work the equipment had to deliver, how many more hours of service were expected from the storage battery in each car. By design, the Edison is the best-equipped to take this unlooked-for extra work.

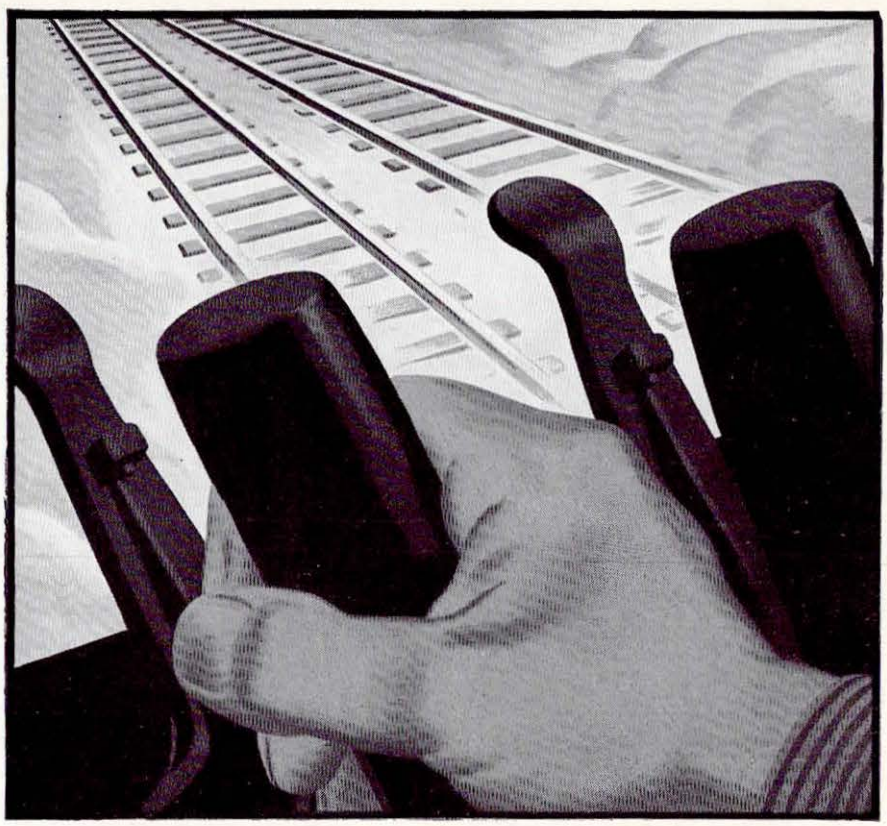
Pounds, Not Tons. Once weight was figured in tons on railroads. Today we're down to *pounds* because every ounce of haulage is important in wartime. This brings the lighter weight of the Edison Battery into sharper focus. Always an advantage, light battery weight becomes almost a necessity today. On the average, Edison Batteries are lighter by a third.



Interesting Reading. Perhaps you have new men in your employ whom you'd like to have learn more about storage batteries. We suggest that you send us their names and we'll put them on the list to receive Storage Battery Power, our house magazine. How about you? Are you getting it? Just write.

Edison Storage Battery Division
Thomas A. Edison, Inc.
WEST ORANGE, N. J.

PEAK POWER needed for war



It is true that all storage batteries in railway passenger car service are specifically rated. But it's the dependable power actually *delivered* which counts under war conditions. Today many cars are in service 50 per cent more of the time than under ordinary circumstances. But where alkaline batteries are working many times harder than their purchasers originally expected they would, they are standing up admirably under such peak demands. It is those cars which are alkaline-battery equipped whose auxiliary lighting job is least likely to go dark under gruelling service.

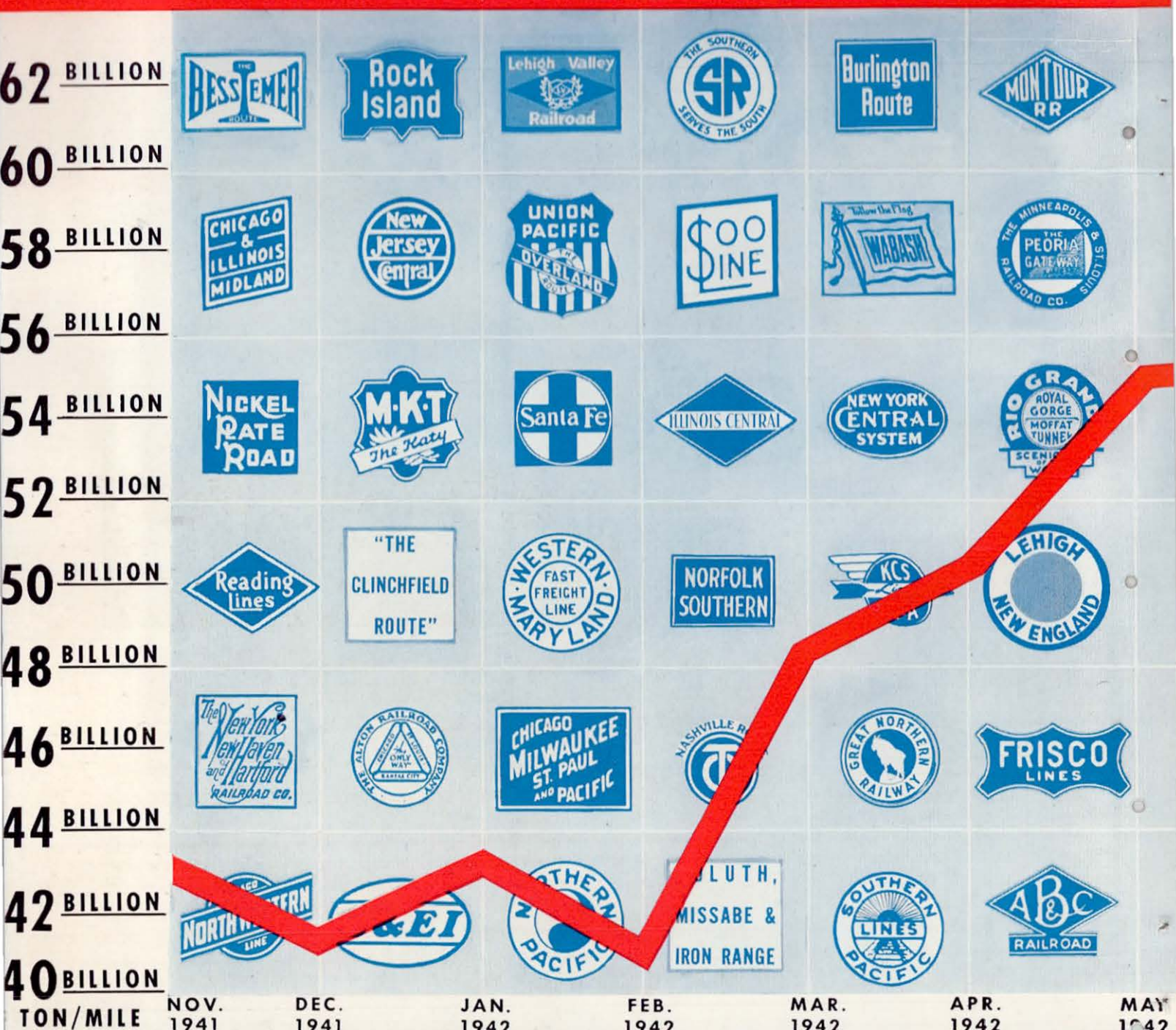
All this is not something which just happened. It is the nature of the battery itself. Ruggedness comes from the Edison's steel-construction, its self-preservation chemical principle and its fool-proof electrical qualities.

RAILROADS NEED THE DEPENDABILITY OF

Edison Alkaline BATTERIES

OVER 16,000 STANDARD

HELP KEEP THE TON/MILE



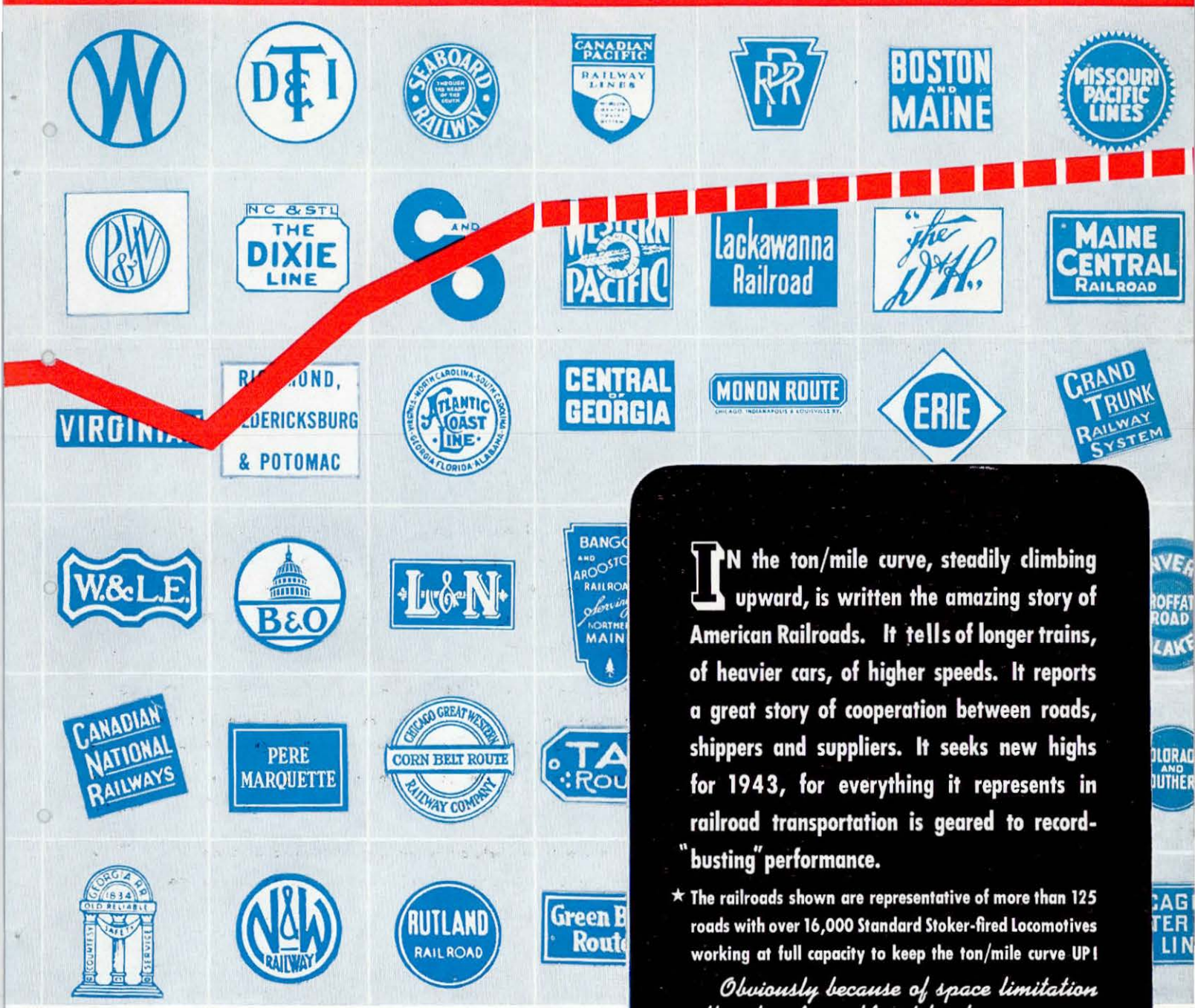
KEEP 'EM ROLLING

THE STANDARD STOKER

NEW YORK • CHICAGO•

STOKERS ON MORE THAN 125* ROADS

CURVE UP-*To Break All Records*



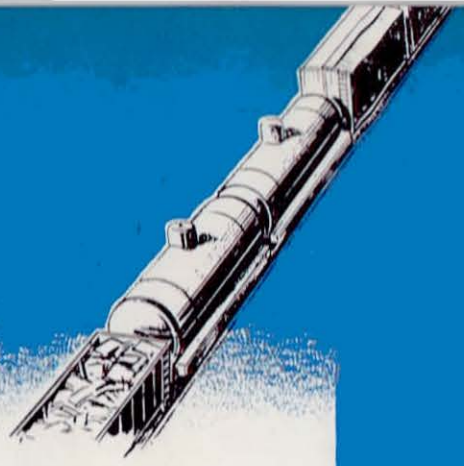
IN the ton/mile curve, steadily climbing upward, is written the amazing story of American Railroads. It tells of longer trains, of heavier cars, of higher speeds. It reports a great story of cooperation between roads, shippers and suppliers. It seeks new highs for 1943, for everything it represents in railroad transportation is geared to record-"busting" performance.

★ The railroads shown are representative of more than 125 roads with over 16,000 Standard Stoker-fired Locomotives working at full capacity to keep the ton/mile curve UP!

Obviously because of space limitation all railroads could not be shown.

AT TOP SPEED

COMPANY, INC
• ERIE •



A Salute to America's Railroads

For Their Great Achievements in 1942

WE of GENERAL STEEL CASTINGS congratulate the American Railroads on their splendid record of performance. All previous traffic volume records were surpassed, constituting an important contribution towards *Winning the War.*

Today, both our Eddystone and Commonwealth plants are geared to maximum production—supplying COMMONWEALTH LOCOMOTIVE PRODUCTS, *on time,* to meet the requirements of the railroads, as well as furnishing important castings for War Department locomotives.

We are also producing, in steadily increasing quantities, vital Steel Castings for the United States Army and Navy.

Proudly we fly the
Army-Navy "E" pennant
Awarded to:

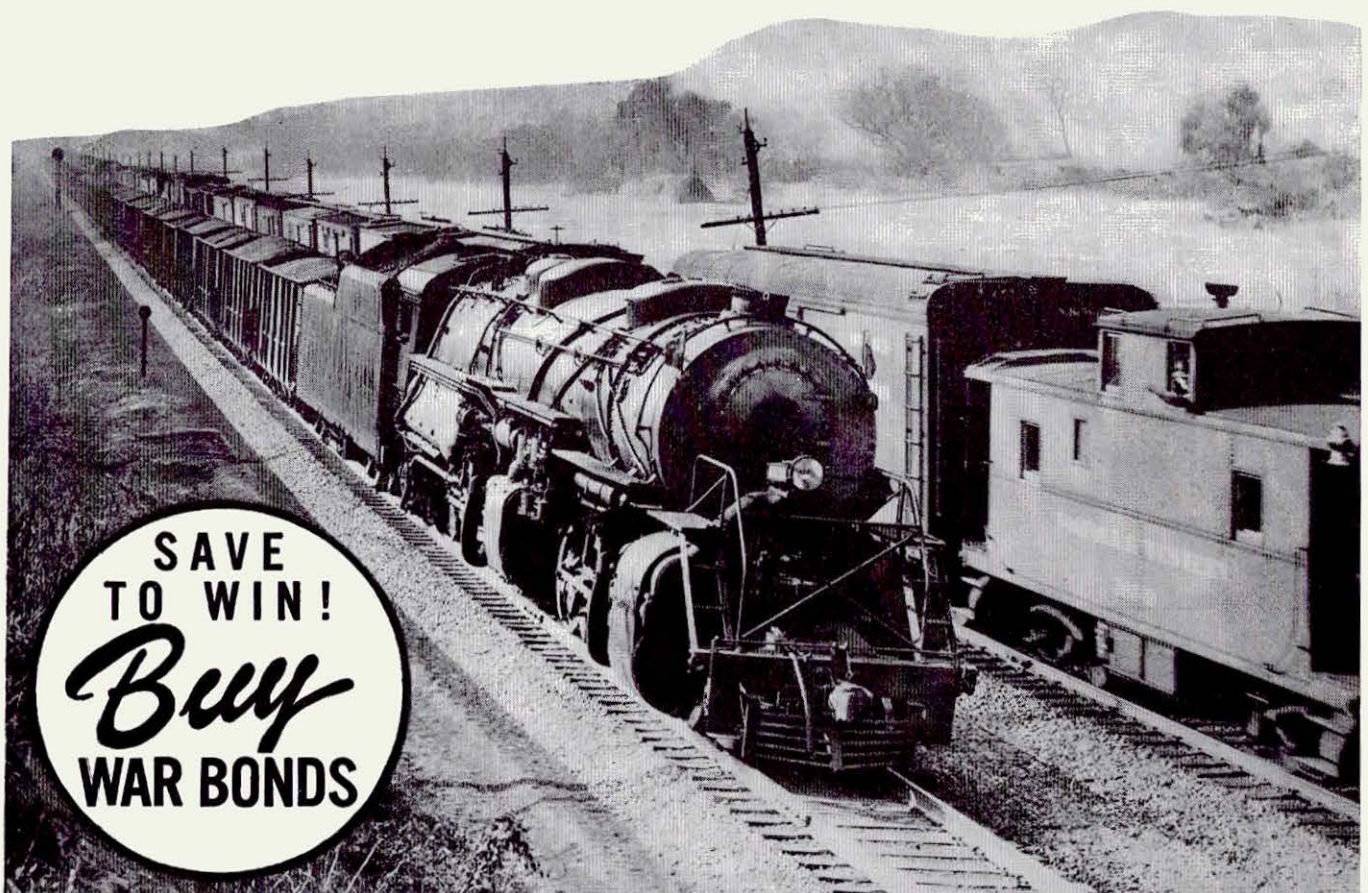
Granite City Plant, Sept. 1942
Eddystone Plant, Oct. 1942

GENERAL STEEL CASTINGS

EDDYSTONE, PA. GRANITE CITY, ILL.

Keep the Tracks Maintained for Victory Transportation

RECENT statistics show that for every five tons of new steel the railroads use, they return to the mills four tons of iron and steel scrap.



THE RAIL JOINT COMPANY INC.
50 CHURCH STREET NEW YORK, N. Y.

PRODUCTS DO AN OUTSTANDING JOB

Barco Products are contributing to the war effort by providing greater safety, greater dependability and lower maintenance.

BARCO ENGINE TENDER CONNECTIONS

Bolted direct to Locomotive and tender, requiring no manifolds—minimum number of 90° bends—metal wearing parts of hardened alloy steel forgings. Used for Water, Steam, Air and Oil.

BARCO STEAM HEAT CONNECTIONS

For Passenger Cars and Rear of Tender

Metal wearing parts hardened alloy steel—only two wearing points per connection—maximum flexibility combined with simplicity and rugged construction provide maximum steam supply with minimum attention and lowest maintenance cost.

BARCO LOW WATER ALARM

Guards against engine failures—May be tested each trip in less than two minutes without any adjustments or disturbance of parts—Actuated solely by the height of the water above the crown sheet—depends on no other variables—Easy to Apply—Easy to Maintain.

BARCO POWER REVERSE GEAR

Provides the fine adjustment and precision-accurate control of locomotive valve motion essential to today's higher speeds. Maintains selected point of cut-off—even a broken air supply pipe will not change the position.

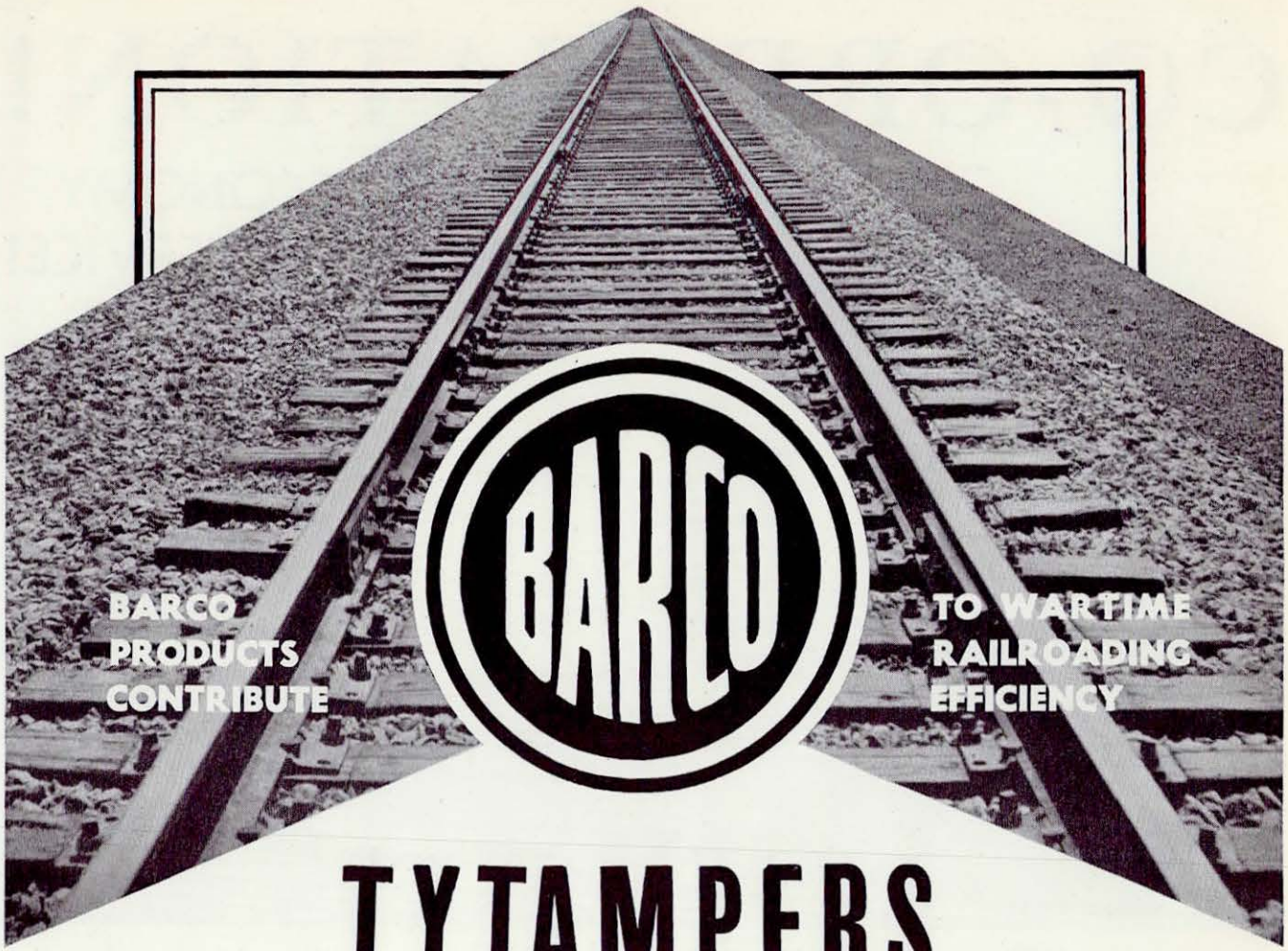
Barco Flexible Joints Save Rubber

BARCO MANUFACTURING COMPANY

1800 W. Winnemac Ave. NOT INCORPORATED Chicago, Illinois

In Canada THE HOLDEN COMPANY, LTD.

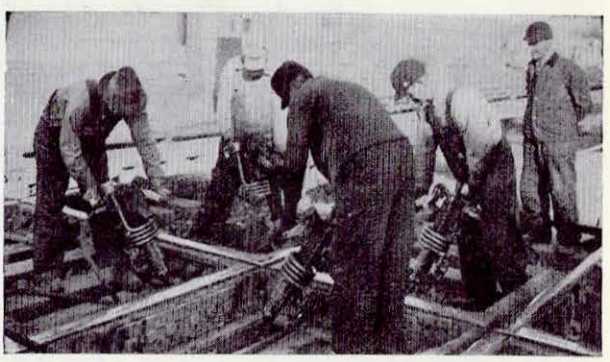
Montreal — Moncton — Toronto — Winnipeg — Vancouver



TYTAMPERS

In 1943 Track Maintenance will be a more important job than ever before.

BARCO Unit Tytampers Do a Better Job Quicker in Out of Face or Spot Tamping at Lower Cost—The Ideal Track Tool for all Year Operation.



Spot tamping at busy terminals and crossings is quickly and easily handled—no auxiliary equipment in the way.

BARCO Tytampers may also be operated from a small light-weight central power plant for out of face tamping, as shown above. This unit, weighing less than 100 lb., and costing less than $100, is supplying power to 12 BARCO Tytampers.

89 RAILROADS ARE USING BARCO TYTAMPERS

Seven Years of Satisfactory Service

BARCO MANUFACTURING CO.

1800 W. Winnemac Ave. Chicago, Ill.

IN CANADA:

THE HOLDEN COMPANY, Ltd.

Montreal — Moncton — Toronto — Winnipeg — Vancouver

CO-ORDINATION!

for SPEED and ECONOMY for MAINLINE SERVICE!

100 ton coal storage—2 track cinder plant with 3500 cu. ft. storage pocket—Dry sand storage house—Sand storage tank, built for one of the leading railroads in the U. S. A.

R AND S COMPANY

- COALING STATIONS
- SAND PLANTS
- ENGINE COALERS
- CINDER PLANTS

Small or Large Units, Single or Combined in "One-Stop" Plants for Coal — Sand — Cinder and Water Service . . . Skilfully Designed, Speedily Erected, Economical, Most Reliable in Service.

Effective results obtained from the above arrangement of plant units, since it is intended for use as an intermediate locomotive servicing plant conveniently located between main terminals of locomotives assigned to long runs.

The coaling station, while of small storage but of high elevation capacity, aids in the speedy dispatch of locomotives. The storage bin for the cinder plants keeps the ordinary blocked track for the cinder cars free at all times, except when car is spotted underneath for removal of cinders. This is an outstanding feature in crowded terminal yards. Largest type 5" diameter sand valves reduce essentially the time for service.

ROBERTS AND SCHAEFER CO.

ENGINEERS AND CONTRACTORS
CHICAGO, U.S.A.

In the battle line . . .

In the war of movement . . .

EXPERIENCE COUNTS!

Not only as organizations but as good Americans, the Freight and Passenger Traffic Departments of the Pennsylvania Railroad want to apply their experience where it will be most useful to the war effort.

Naturally, that experience can *best* serve in one of the war's most vital phases—*movement of fighting men and materials.*

Right now, of course, our combined traffic experience is working day and night for the Army, the Navy and Industry.

But we would like to do more for you! If vital materials are not rolling to your assembly lines as promptly as you would like to have them . . . if you need more cars . . . if you are puzzled about some new rule, regulation or rate applying to specific types of war shipments . . . any of the many problems that crop up in transportation, please let us help you. We have the means, the knowledge, the experience.

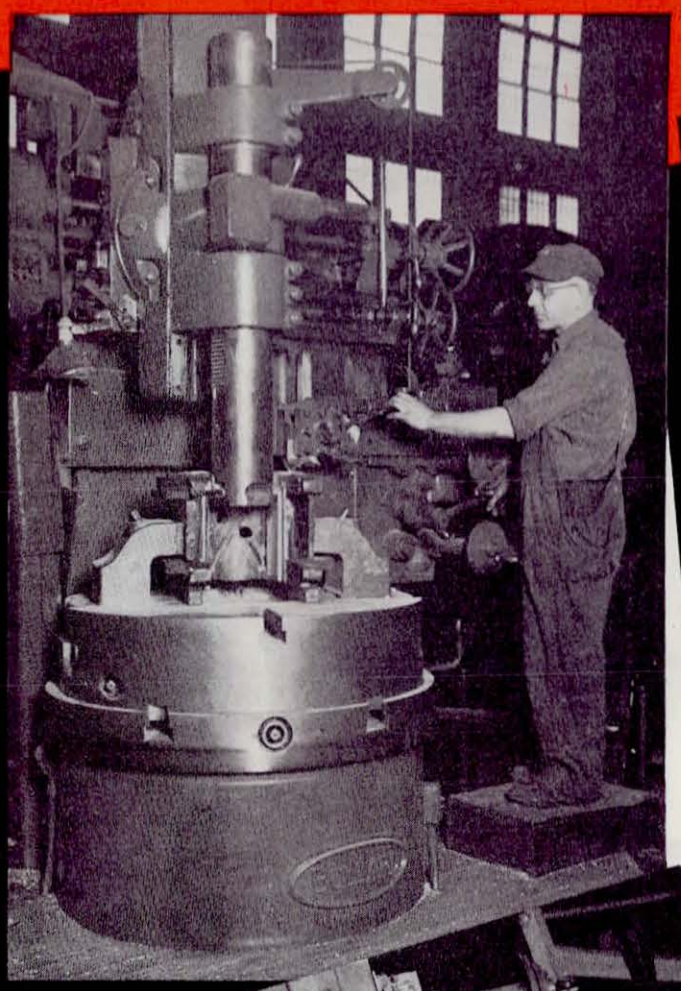
For, in the final analysis, both you and we have a common objective—*to make our individual experiences produce the maximum for the war effort.* Therefore, if our transportation experience can help you get more out of your manufacturing experience, you are invited to use it.

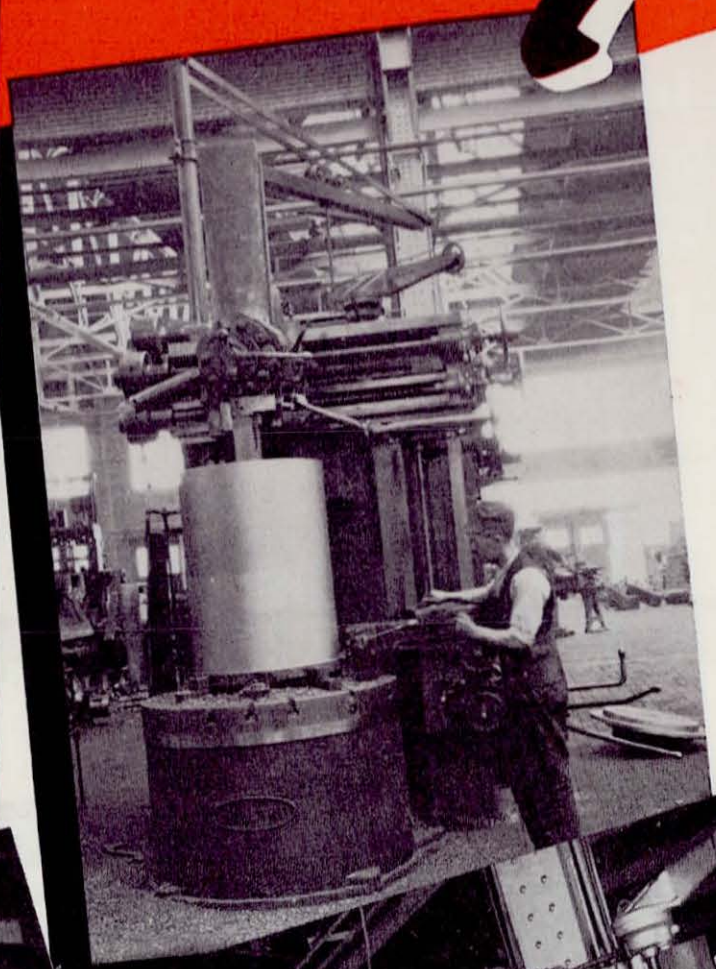
Pennsylvania Railroad

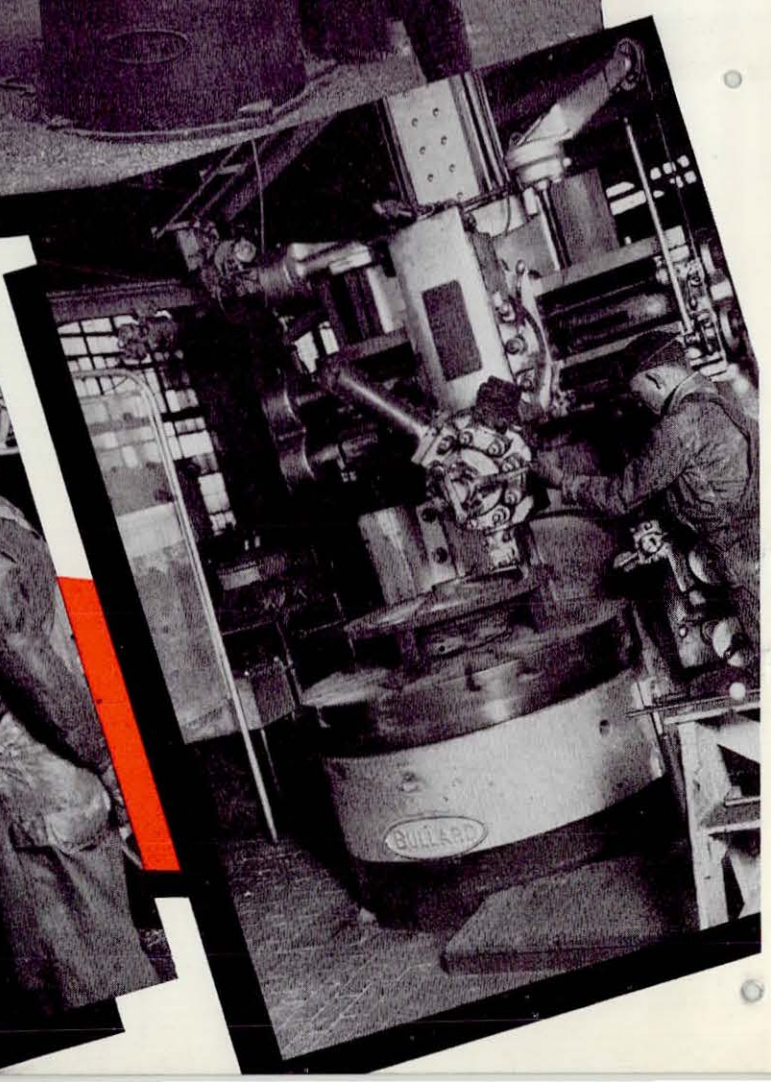
SERVING THE NATION

BUY UNITED STATES WAR BONDS AND STAMPS

Victory







SHOP SCHEDULES

VICTORY transportation schedules demand Victory shopping schedules for all power going to the back shops for classified repairs.

It is obvious that intensive, high speed operation of locomotives must be protected with modern high speed machine tools which have the capacity to handle extra loads.

Bullard R. R. Shop Machine Tools are playing a vital part in keeping the Nation's power in shape for Victory transportation. They will be found in most all leading railroad shops meeting every demand for parts required on the erecting floors.

The variety of locomotive parts machined on BULLARD R. R. Shop Units are estimated to be about 75% of all railroad shop boring and turning jobs—And they are turned out for approximately 50% less cost than on the ordinary mills.

BULLARD R.R. Shop Units

THE BULLARD COMPANY

BRIDGEPORT, CONNECTICUT

Carey PRODUCTS

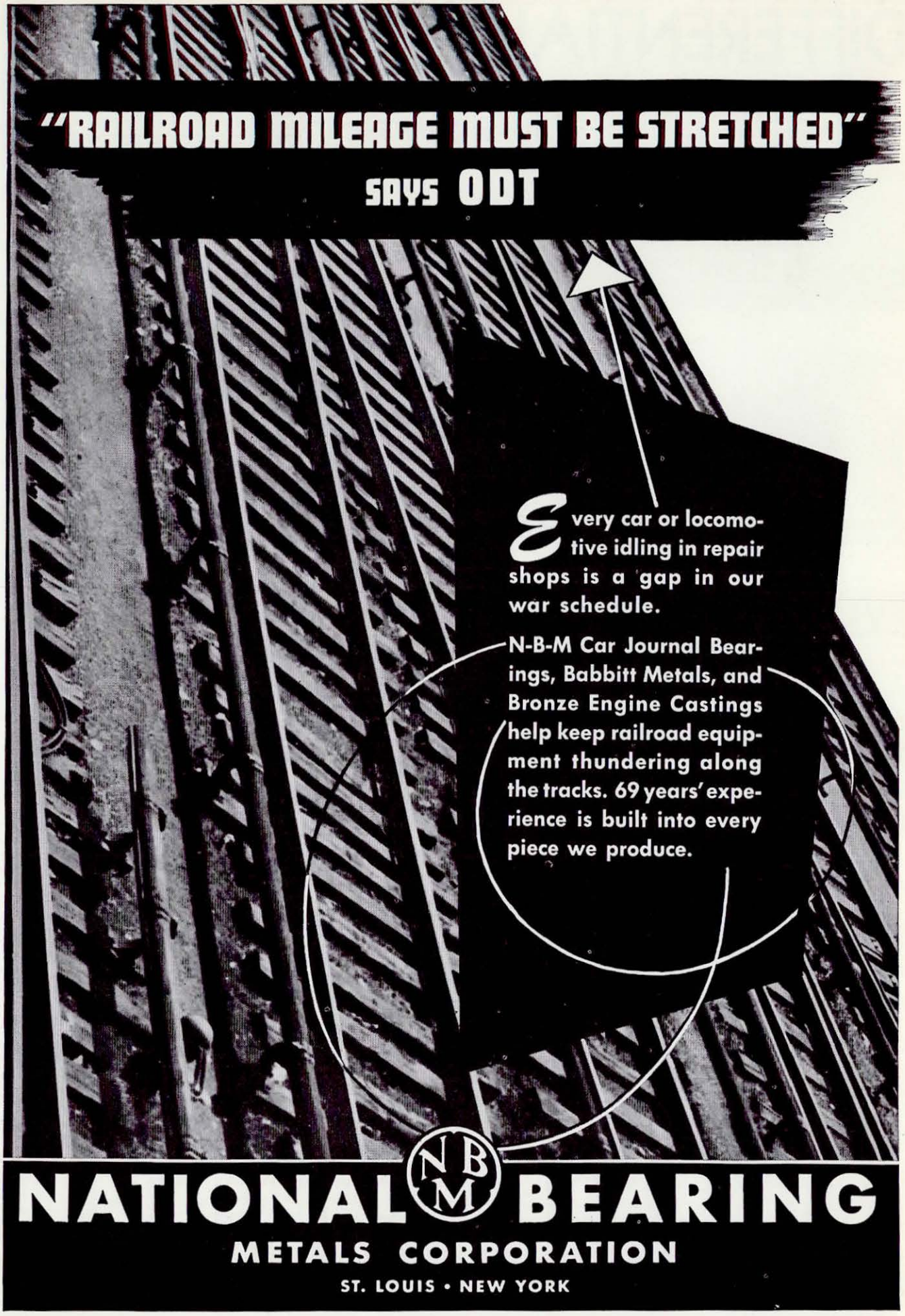
★ OVER TWO THIRDS OF A CENTURY OF SERVICE TO RAILROADS . . .

★ LOCOMOTIVE LAGGING . . . HEAT INSULATION . . .
ELASTITE BRIDGE WATERPROOFING
CAREYSTONE CORRUGATED ROOFING AND SIDING
BUILT-UP ROOFS . . . INDUSTRIAL FLOORING
ELASTITE EXPANSION JOINTS . . . SMOKE JACKS
FIBROUS CAR CEMENT . . . ASBESTOS CEMENTS
ASPHALT CAR ROOFINGS . . . ASBESTOS-
WALLBOARD AND SHEATHING . . . ASBESTOS-
MILLBOARD . . . ROCK WOOL INSULATION
ASBESTOS SHINGLES AND SIDING . . .
ROOF COATINGS AND CEMENTS . . .
ASBESTOS ROPE AND WICK PACKING . . .
ASPHALT SHINGLES AND ROLL ROOFINGS . . .
ASBESTOS SWEEPING COMPOUND

THE PHILIP CAREY MANUFACTURING COMPANY

LOCKLAND, CINCINNATI, OHIO *Dependable Products Since 1873*

In Canada: The PHILIP CAREY COMPANY, Ltd. ● *Office and Factory, Lennoxville, P. Q.*


"RAILROAD MILEAGE MUST BE STRETCHED"
SAYS ODT
Every car or locomotive idling in repair shops is a gap in our war schedule.
N-B-M Car Journal Bearings, Babbitt Metals, and Bronze Engine Castings help keep railroad equipment thundering along the tracks. 69 years' experience is built into every piece we produce.
NBM
NATIONAL BEARING
METALS CORPORATION
ST. LOUIS • NEW YORK

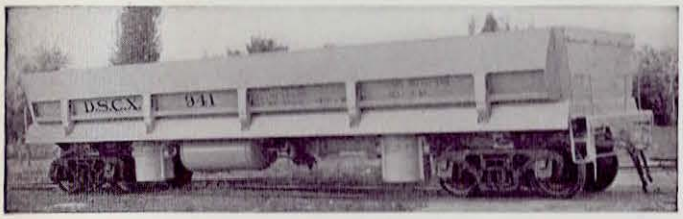
DIFFERENTIAL AIR DUMP CAR

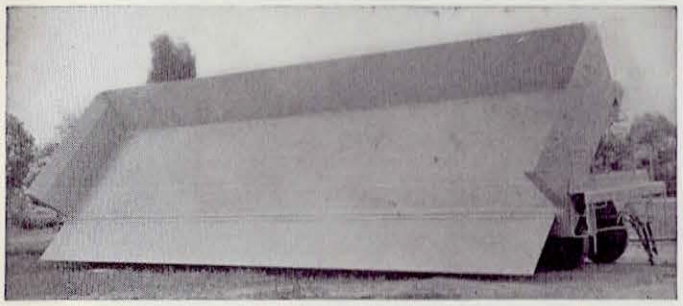
PATENTED

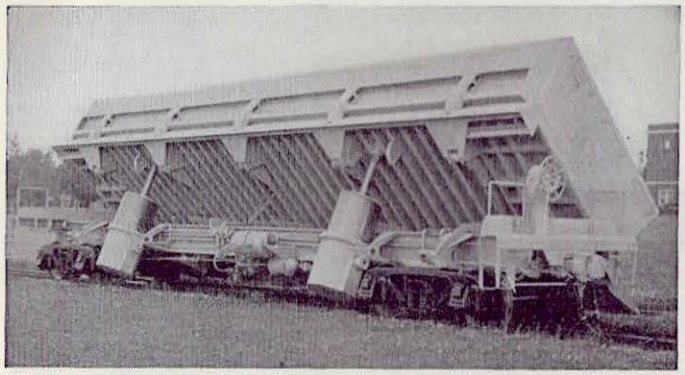
Double Trunnion

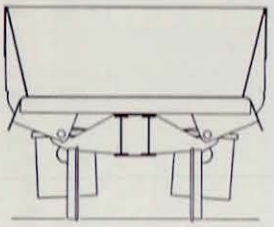
Dumps Either Side

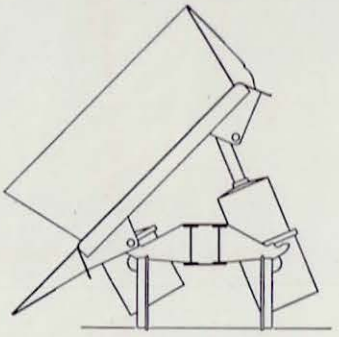
Double Fulcrum

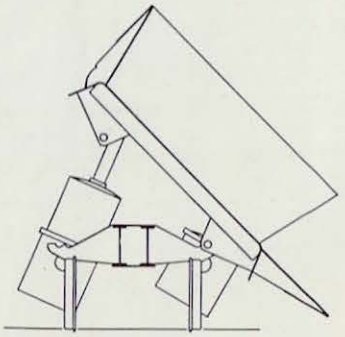












The Automatic Air Dump Car of Many Uses

DITCHING ● CONSTRUCTION ● RIP RAP CINDER DISPOSAL ● TERMINAL WASTE DISPOSAL ● REVENUE SERVICE ● RECLAIMING LOW WASTE LAND ● FILLING IN TRESTLES ● STOCK PILING COAL

The diagrams above illustrate the double fulcrum principle employed in the design of the Differential car. The dump body is supported on widely spaced fulcrums. There is no rocking or swaying of the body during transport as the body is in stable equilibrium. The double fulcrum principle has entirely eliminated the locking mechanism. There is no possibility of accidental dumping. The load is deposited an extreme distance from the track. Operation of side doors entirely automatic.

Dumps 50 to 70 tons far away from track in a few seconds. Completely automatic. Saves time, labor, money and increases safety

Write for descriptive Bulletins.

DIFFERENTIAL
STEEL CAR CO.
FINDLAY, OHIO

Last year Chase Velmo shipments to railroads established an "on time" record any Class I road could well be proud of...in spite of labor shortages, slow deliveries of raw stock and pressing demands for special military fabrics.

DELIVERED . . . AS PROMISED

This stamp on all but one Velmo order in the Chase "1942 Railroad Orders Filled" file is the result of careful planning and a production policy that always keeps "railroad looms" on a stand-by basis, ready to weave immediately against your upholstery orders.

1943? More than ever you'll need on-time deliveries of Velmo Upholstery . . . for recovering and repairing seats in your overworked passenger equipment. We've scheduled production, as we did in 1942, to fill your priority orders on a "Delivered as Promised" basis without any sacrifice of traditional Velmo quality.

• • •

Let skilled Chase field men help work out your 1943 war-time upholstery maintenance and replacement program with samples, prices and shipping dates. Ask them for suggestions about upholstery cleaning and spray dyeing. ***One of their most important war jobs is to help you do yours.***

CHASE VELMO

L. C. CHASE AND COMPANY • 295 Fifth Avenue, New York City

Sales Division of Sanford Mills • Offices: Boston, Detroit, Chicago, Los Angeles

Stopping

JUST AS IMPORTANT AS ROLLING

"HSC" BRAKE

INTENSIFIED use of railway trackage and rolling stock requires a high degree of coordination in train movement. Train orders and signals tell the engineman when he may "roll" and—they also tell him when he MUST stop. The latter is just as important as the former and safe emergency stops are vital to life and property.

The "AB" Brake for freight service and the "HSC" for high-speed passenger service provide stopping force to match high speeds, powerful locomotives, and heavy loads. The New York Air Brake Company designed them both to save lives, lading, equipment, and time—to get more trains over your road more safely.

THE NEW YORK AIR BRAKE COMPANY

420 Lexington Avenue, New York City Plant: Watertown, New York

"AB" BRAKE

39,000 LOCOMOTIVES with modern water treatment handle record volume of traffic

Without modern water treatment, at least 60,000 locomotives would be required. (Some estimate twice as many would be needed)

"Improved water treatment has done more to promote intensive utilization of power than any one thing." ★

"This alone—(reduction of flue failures by water treatment)—has been one of the greatest factors in permitting increased locomotive availability." ★

"Another great development . . . water treatment has permitted long engine runs and extended periods between washouts." ★

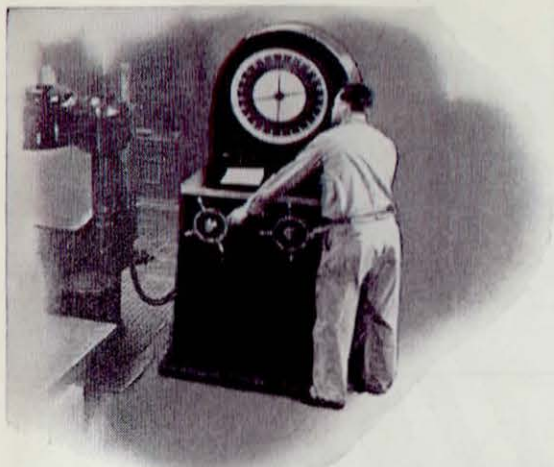
"Utilization of locomotives . . . at the present time is the greatest that has ever been secured." ★

GOOD WATER
is readily obtainable . . .
locomotives are not

★ *Excerpts from talks presented by leading railroad executives before the Western Railway Club, Nov. 16, 1942.*

NATIONAL ALUMINATE CORPORATION
PAIGE-JONES CHEMICAL COMPANY
6216 West 66th Place **Chicago, Illinois**

NALCO SYSTEM OF WATER TREATMENT



HE READS THE *"Life-lines"* OF GLOBE PRESSURE TUBES

The life expectancy of a Globe Pressure Tube is an open book to the Globe metallurgist. Frequent laboratory tests, including photomicrographic inspection, in addition to careful and thorough individual gauging for wall thickness and outside diameter, insure a consistently uniform quality of product.

Such extra precautions in manufacture may readily be translated into longer life and greater safety in use. This extra margin of safety and strength means lower cost in the long run for the user of Globe Pressure Tubes.

Globe Engineers are always available to assist in selecting a tube with the exact characteristic you require.

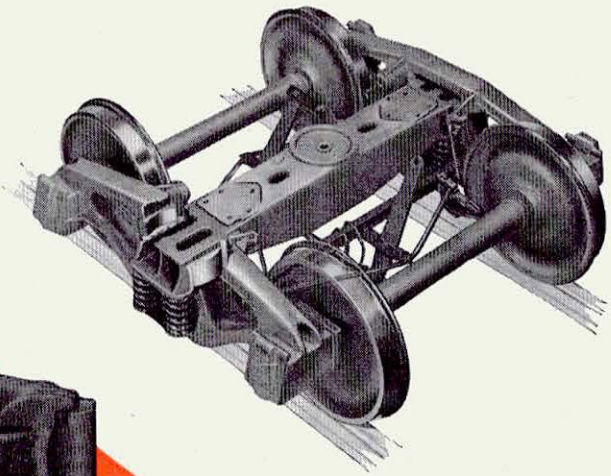
GLOBE STEEL TUBES CO., Milwaukee, Wis.

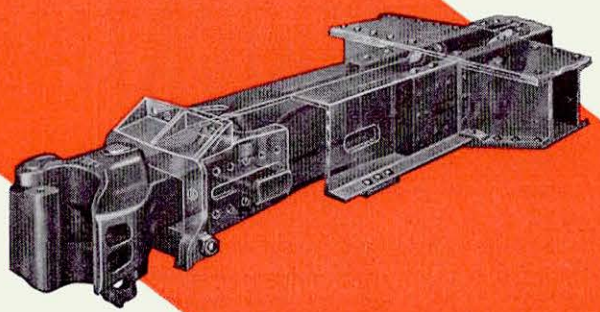
STAINLESS TUBES
BOILER TUBES
CONDENSER AND HEAT EXCHANGER TUBES
MECHANICAL TUBING

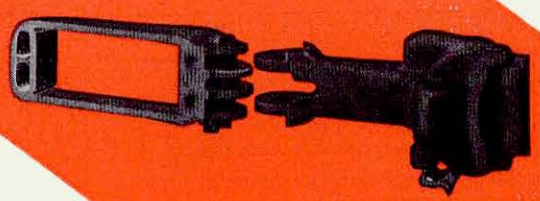
GLOBE STEEL *Tubes*

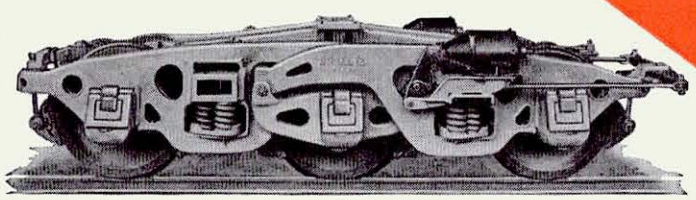
GLOBE TUBES

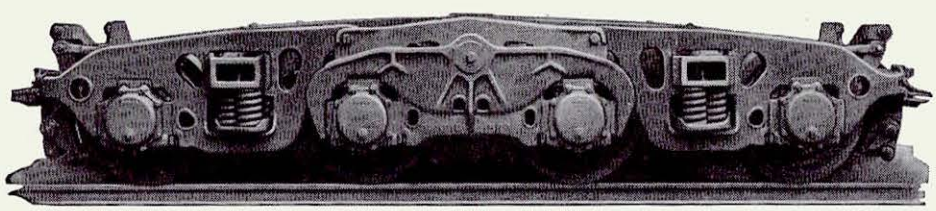
BUCKEYE
Cast Steel Products







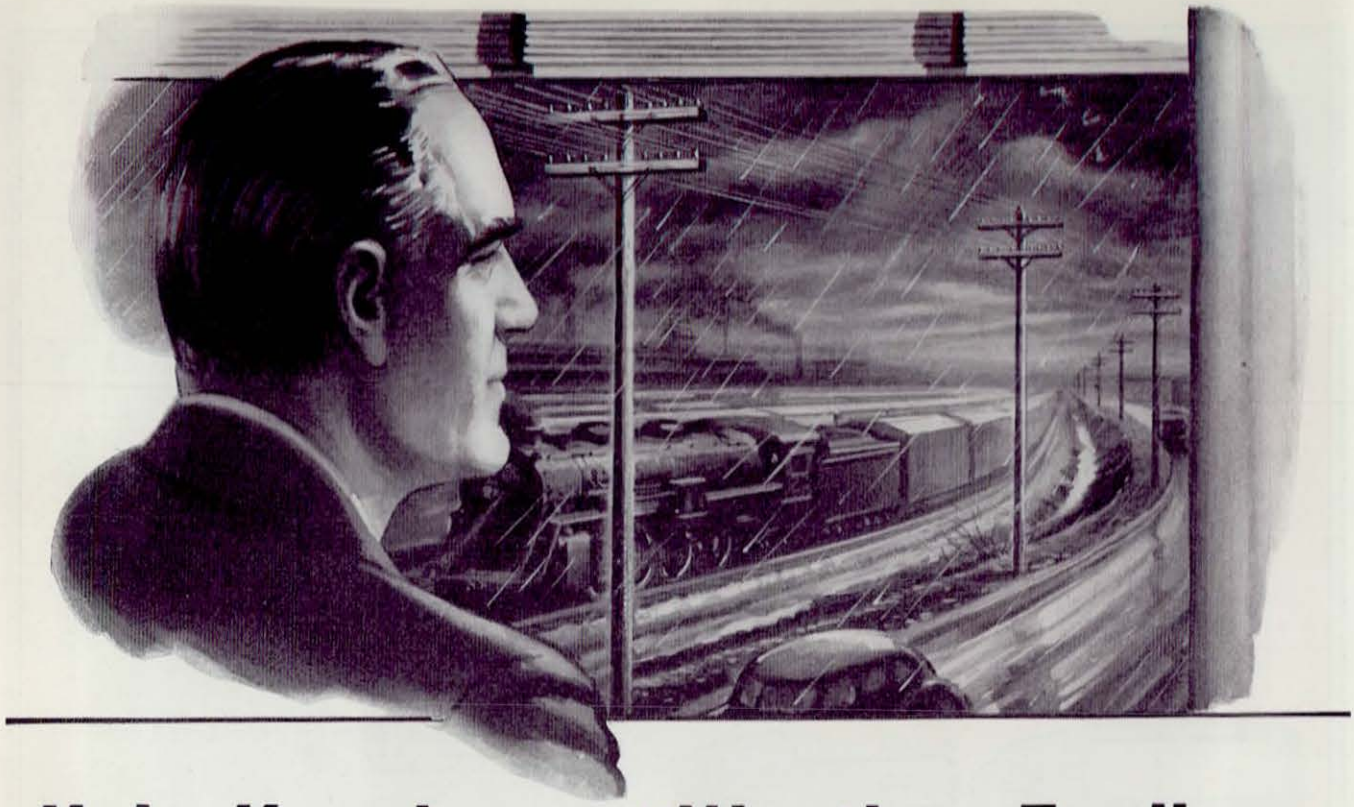




THE BUCKEYE STEEL CASTINGS COMPANY

Manufacturers of Couplers, Truck Frames and Bolsters,
Draft Attachments and Tender Trucks

NEW YORK **COLUMBUS, OHIO** CHICAGO



He's Keeping a "Weather Eye" on Your COMMUNICATION Lines

Your GRAYBAR Man is as alert as your own maintenance staff to emergencies of wind and weather. He's pledged to help you keep communication lines open, aiding the efficiency and safety of essential wartime transport.

His help begins before emergencies arise. Although our local stocks are not what they were, he can help you plan ways and means for getting what's critically needed in a hurry. Often, he can supply alternates to meet an emergency, when specified items are unavailable.

Should storms strike with damaging severity, the whole network of GRAYBAR "mobilization points" can be called upon for the supplies to restore communications. And all over the country, you'll get the backing of men familiar with railway needs, with experience in helping them meet emergencies like the New England Hurricane, the Ohio River floods, and blizzards and ice storms beyond count.

As a "one-call" source for all your electrical needs . . . pole-line supplies . . . telephone equipment . . . indoor and outdoor lighting . . . motors and power supply items for repair shops . . . GRAYBAR can help you travel the shortest routes through today's priority maze. For emergency or day-to-day needs, why not make your GRAYBAR Man your electrical "materials mobilizer"?

EMERGENCY "KNOW-HOW"
That Helps You
BEAT THE SLEET

PLANNING "KNOW-HOW"... based on GRAYBAR experience in emergencies dating back before the Blizzard of '88 and extending through three wars.

DELIVERY "KNOW-HOW"... backed by a nationwide network of warehouse facilities and the means for getting what's available to the point where it's most badly needed.

COORDINATION "KNOW-HOW" . . . resulting from long successful experience in serving *both* manufacturers and railroads.

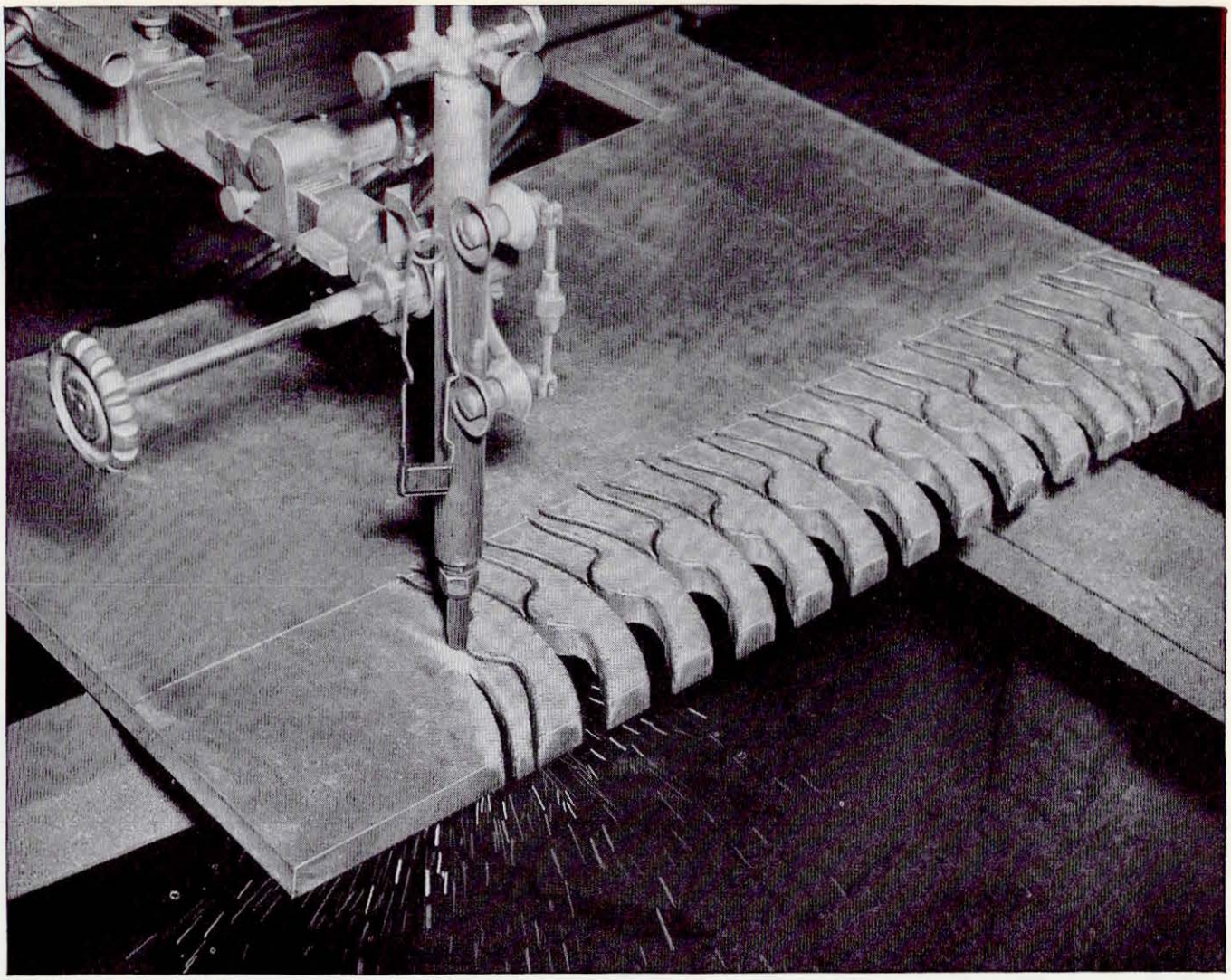
MANPOWER "KNOW-HOW"... evidenced by the more than 20 years average experience of GRAYBAR Managers and Specialists.

GraybaR

IN OVER 80 PRINCIPAL CITIES

GraybaR QUALITY SINCE 1869 REG. U.S. PAT. OFF. — Everything Electrical . . . . THAT IT TAKES TO WIN!

Executive Offices: **GRAYBAR BUILDING, NEW YORK, N. Y.**



Get The Most Parts From The Least Steel

BY CAREFUL LAYOUT OF CUTS

● Careful layout of shapes that are to be flame-cut is of particular importance today because it helps to insure getting the most parts from the least steel, with minimum scrap losses. In cutting some large shapes where sizable pieces of metal are removed by the flame, these pieces can be used as material for the production of smaller needed parts — because when oxy-acetylene cutting is the method of fabrication used, the metal removed is all in one piece. Parts produced by flame-cutting on Oxweld machines have clean, smooth edges that usually need no machining before use, and machines and machine tools are thus made more continuously available for other essential work. Oxweld instructors can help operators to handle their shape-cutting with maximum conservation of materials.

THE OXWELD RAILROAD SERVICE COMPANY
Unit of Union Carbide and Carbon Corporation

UCC

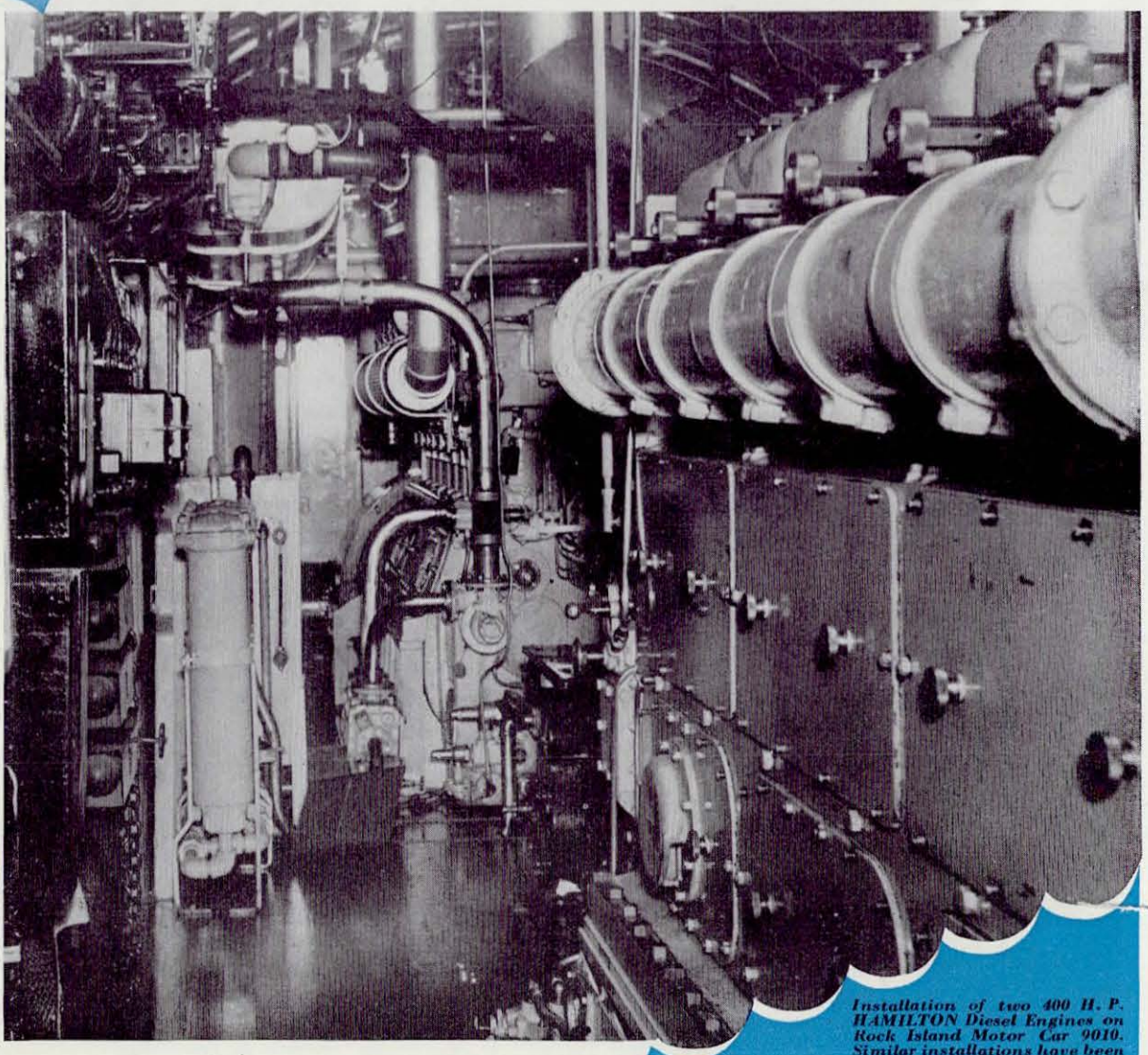
Carbide and Carbon Building Chicago and New York

SINCE 1912—THE COMPLETE OXY-ACETYLENE SERVICE FOR AMERICAN RAILROADS

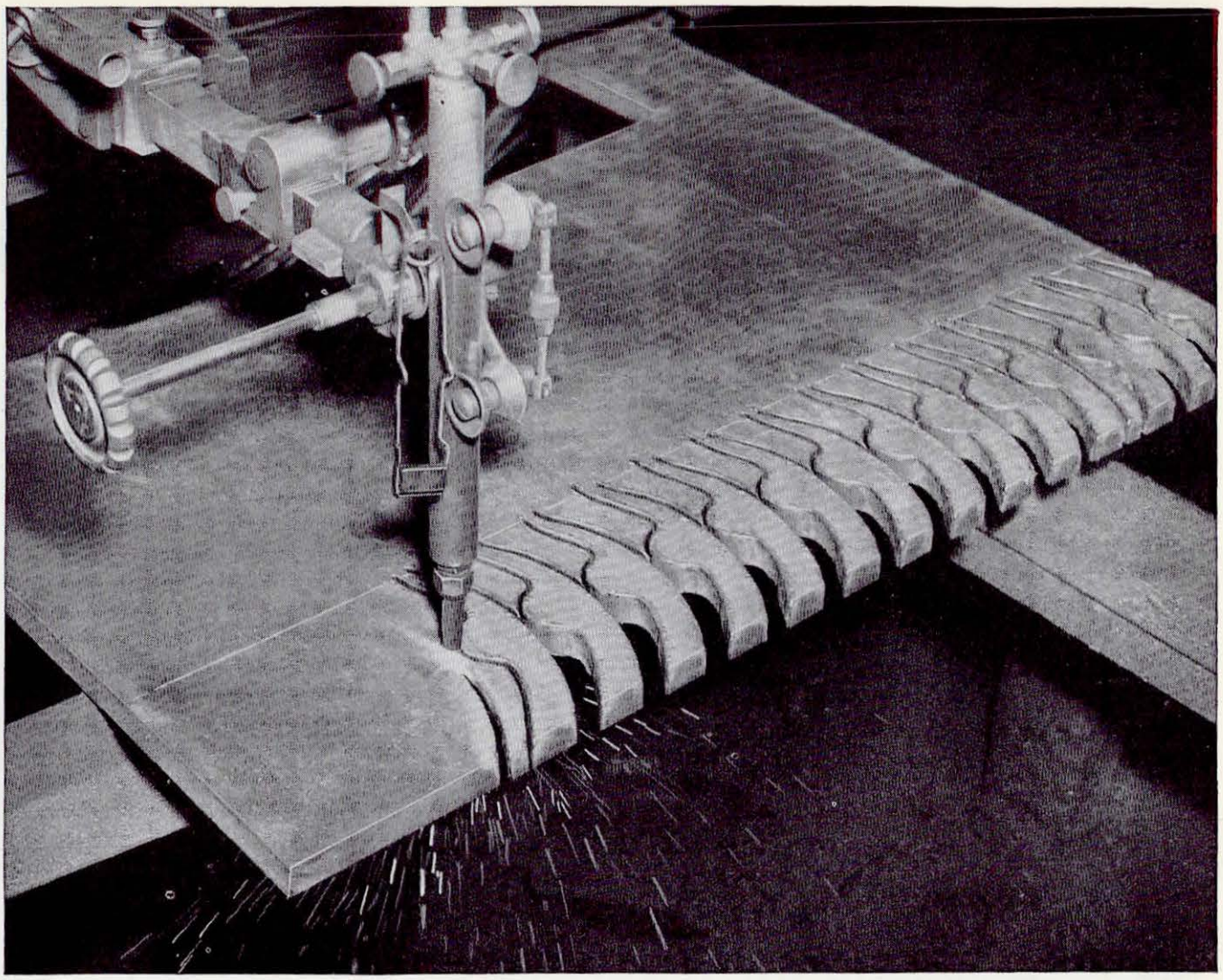
The word "Oxweld" is a registered trade-mark of a Unit of Union Carbide and Carbon Corporation.

More Power to Wartime Transportation

HAMILTON DIESELS *HALVE* Fuel Costs on 5 Rock Island Cars



Installation of two 400 H. P. HAMILTON Diesel Engines on Rock Island Motor Car 9010. Similar installations have been made on Motor Cars 9007, 9009, 9013 and 9090.



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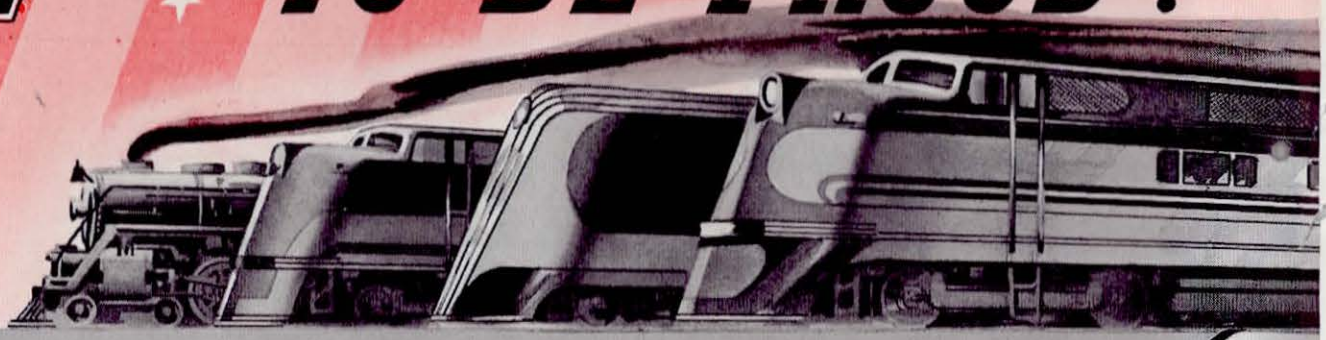
Carbide and Carbon Building Chicago and New York

SINCE 1912—THE COMPLETE OXY-ACETYLENE SERVICE FOR AMERICAN RAILROADS

The word "Oxweld" is a registered trade-mark of a Unit of Union Carbide and Carbon Corporation.

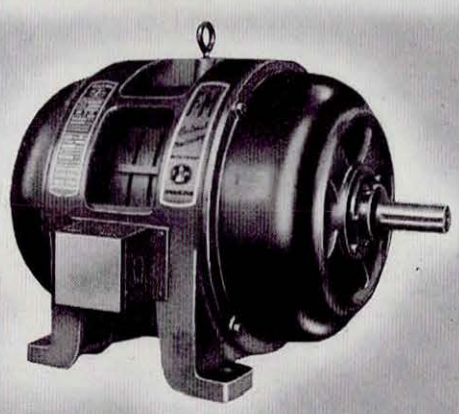
THEY'VE A RIGHT TO BE PROUD!



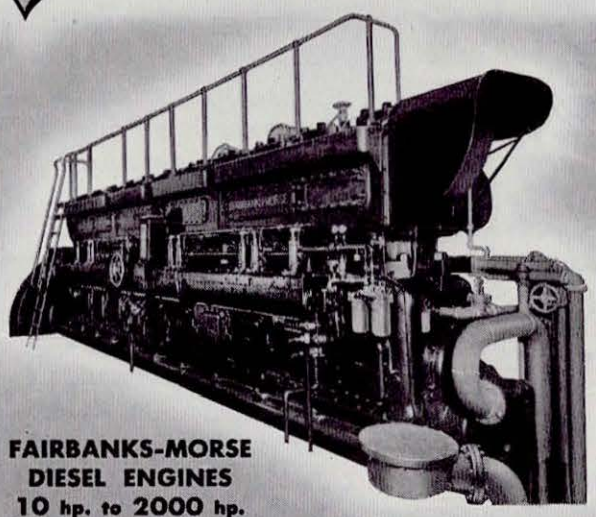
BEFORE the smoke of the sneak attack on Pearl Harbor cleared away, American railroads were on a wartime footing. They didn't have to get ready—they were ready. Their record from then until now has proved it . . . a record of which they've a right to be proud.

We of Fairbanks-Morse take considerable pride in that record ourselves. Through four generations of railroad men, we've been supplying the type of behind-the-scenes railroad equipment that contributes substantially to the record of American railroads, unequaled by any other railroad in the world.

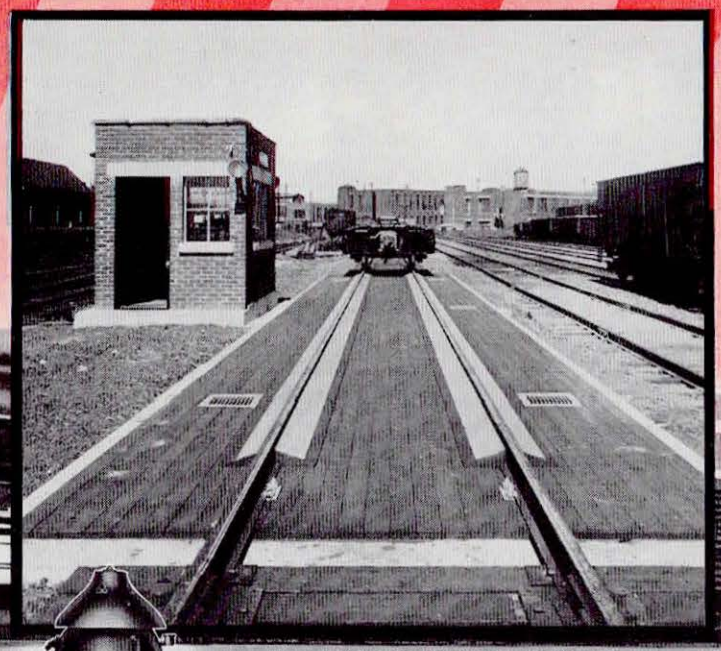
Starting "way back" when ninety-pound rails were undreamed of and brakemen on a freight train had to combine the abilities of a tightrope walker and Gargantua the Great, the Fairbanks-Morse line of railroad equipment has expanded with the railroads. Today, like railroad service, the Fairbanks-Morse line of railroad equipment is the best it has ever been.



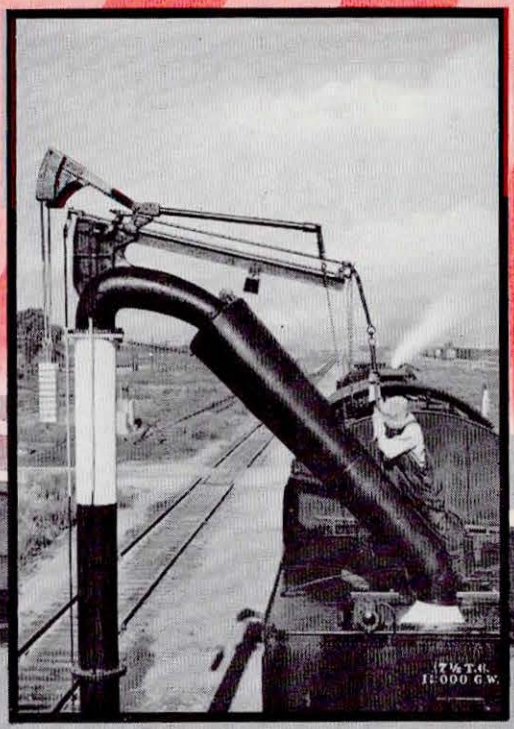
FAIRBANKS-MORSE
MOTORS AND GENERATORS



FAIRBANKS-MORSE
DIESEL ENGINES
10 hp. to 2000 hp.



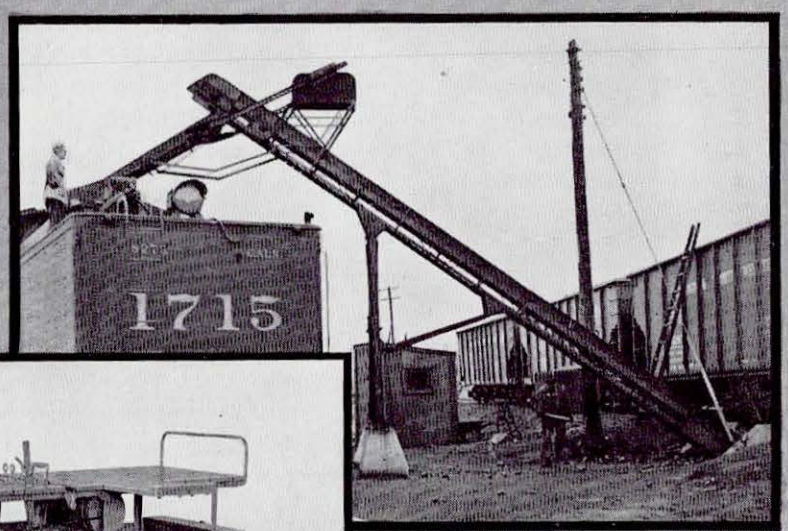
FAIRBANKS-MORSE SCALES
1- to 1-million pounds capacity
(pictured is track scale)

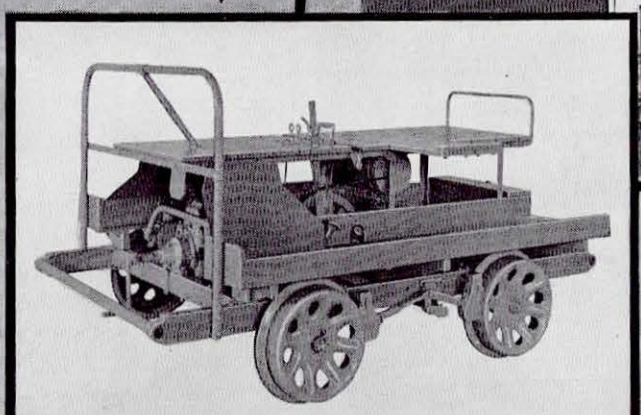


FAIRBANKS-MORSE
LOCOMOTIVE WATER CRANES

FAIRBANKS-
MORSE PUMPS—
steam; power; trash; angleflow, centrifugal, rotary, turbine, and propeller types. *(Turbine pictured.)*

FAIRBANKS-MORSE
SHEFFIELD
MOTOR CARS
"First on the rails and still first"





FAIRBANKS-MORSE
COALING STATIONS
(pictured is automatic conveyor coaler)

FAIRBANKS, MORSE & CO.

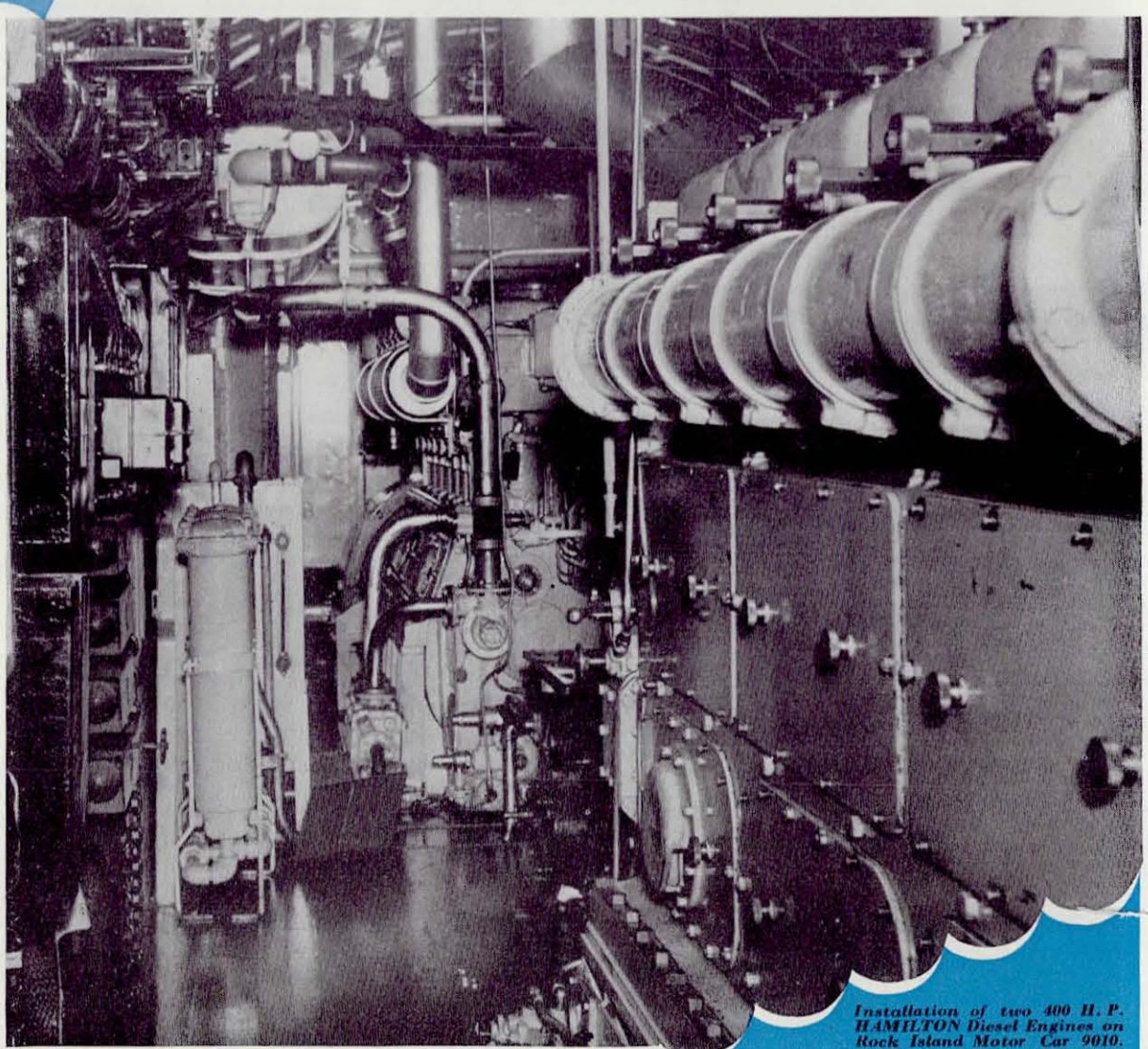
600 SOUTH MICHIGAN AVENUE, CHICAGO, ILLINOIS

RAILROAD SALES OFFICES: NEW YORK • CHICAGO • ST. LOUIS • ST. PAUL
CINCINNATI • ATLANTA • NEW ORLEANS • SAN FRANCISCO

Canada: Canadian Fairbanks-Morse Co., Ltd., Montreal, Toronto, Winnipeg

More Power to Wartime Transportation

HAMILTON DIESELS *HALVE* Fuel Costs on 5 Rock Island Cars



Installation of two 400 H. P. HAMILTON Diesel Engines on Rock Island Motor Car 9010. Similar installations have been made on Motor Cars 9007, 9009, 9013 and 9090.

Rock Island Diesel Motor Car 9010, Converted to HAMILTON Diesel Power.

Again, during 1942, Hamilton Diesels have proved their outstanding ability to render smooth, economical service under most rigorous wartime conditions.

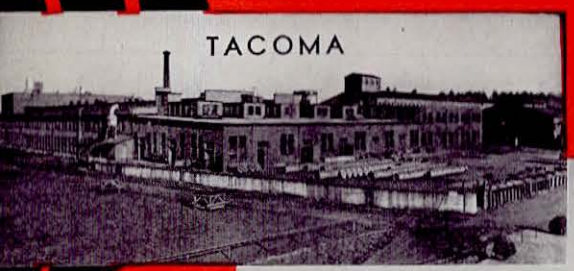
In an exhaustive series of tests, ranging over extensive periods of time, five Rock Island Auxiliary Streamliners, converted to Hamilton Diesel Power, rendered the traditional satisfactory trouble-free Hamilton service. Fuel costs were practically halved, with additional substantial savings in lubrication and maintenance expense.

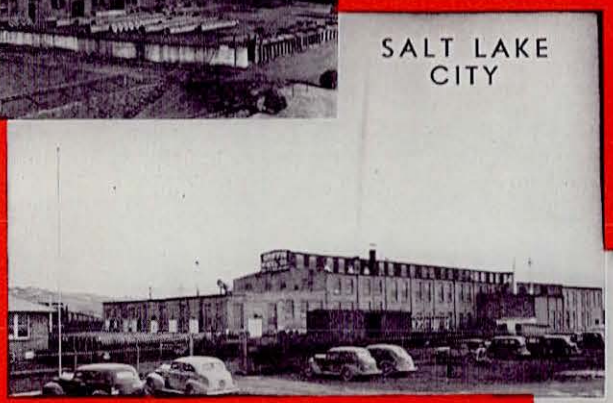
Hamilton Diesels bring more power to wartime transportation. They also aid the railroads and the Nation in their fuel conservation effort and effect considerable savings in labor and maintenance.

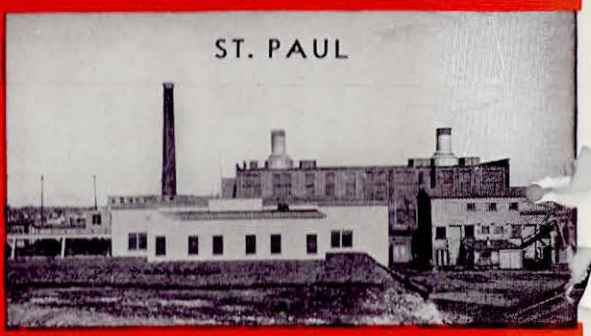
GENERAL MACHINERY CORP.

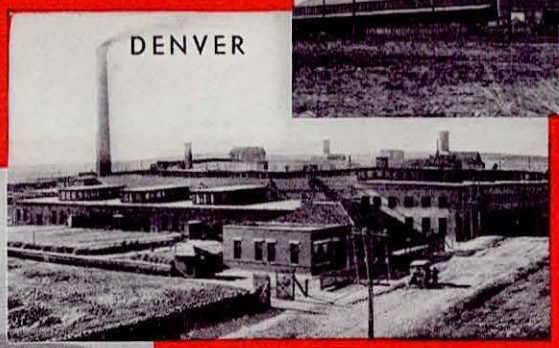
HOOVEN, OWENS, RENTSCHLER DIVISION **HAMILTON, OHIO.**

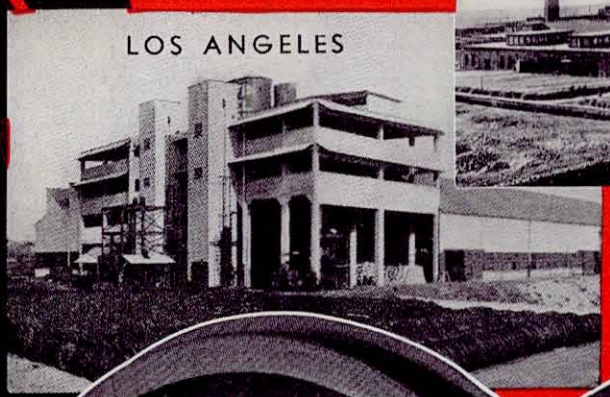
12 Griffin PLANTS









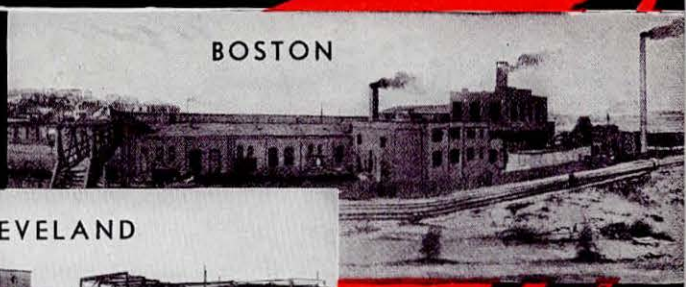


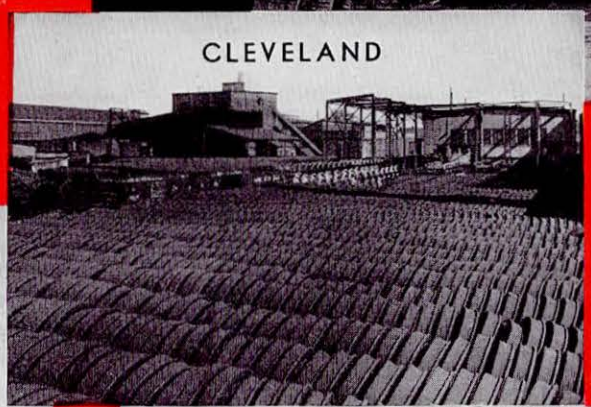
CAPACITY . . .
More Than
1,000,000 WHEELS
Per Year

GRIFF
410 NORT

SAVES THOUSANDS OF CAR MILES

OVER 80% OF THE FREIGHT HAULED TODAY IS CARRIED ON CHILLED IRON WHEELS





TRANSPORTATION IS ONE OF THE COUNTRY'S GREATEST PROBLEMS TODAY.

1 GRIFFIN plants are located at principal railroad centers thruout the United States.

2 Minimum haul — often only a switching movement on both new and old wheels.

3 Old wheels are converted into new wheels with a metal loss of only 3%.

4 Immediate deliveries because of stocks maintained at Griffin plants.

KEEP THE CARS ROLLING ON GRIFFIN WHEELS!

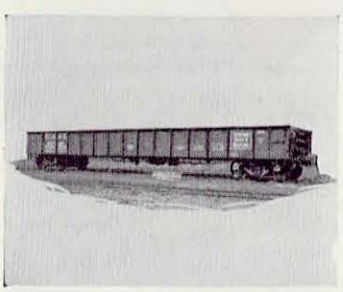
IN WHEEL COMPANY

H MICHIGAN AVE., CHICAGO, ILL.

TRANSPORTATION is

MT. VERNON

MT. VERNON



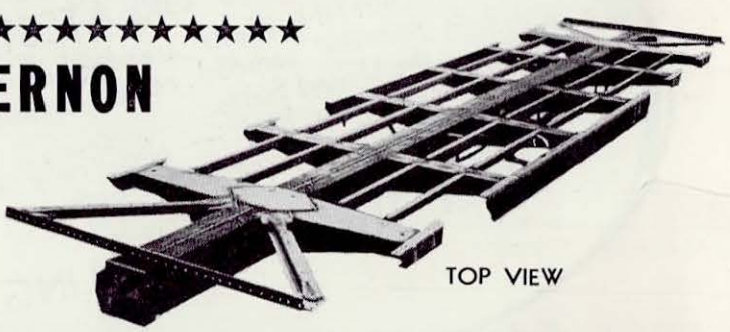
MT. VERNON

Mt. Vernon Freight Cars Keep Material and Munitions Rolling On the Way to Victory

MT. VERNON IS NOW SERVING OUR GOVERNMENT BY BUILDING ORDNANCE, GOVERNMENT CARS AND FABRICATED SHIP SECTIONS, AS WELL AS CARS FOR DOMESTIC USE.

MT. VERNON BUILT "U. P." DESIGN

MT. VERNON



TOP VIEW

MT. VERNON CAR MAN

Vital to VICTORY!

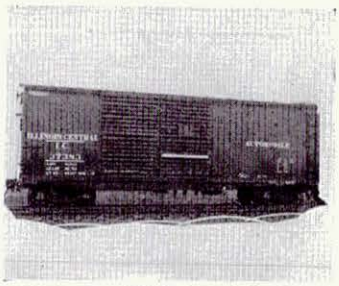
53 *Years of Experience In Progressive Car Building*

IT'S A PLEASURE FOR MT. VERNON TO BUILD CARS JUST THE WAY THE RAILROADS WANT THEM BUILT. MT. VERNON ALSO SUPPLIES CAR FORGINGS, CAR PARTS AND AAR CHILLED TREAD WHEELS

ALL WELDED ALLOY STEEL UNDERFRAMES

MT. VERNON

MT. VERNON



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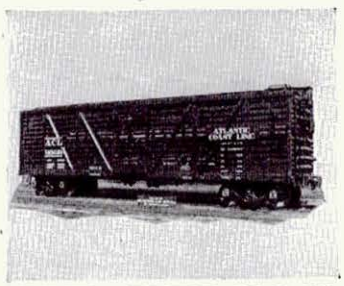
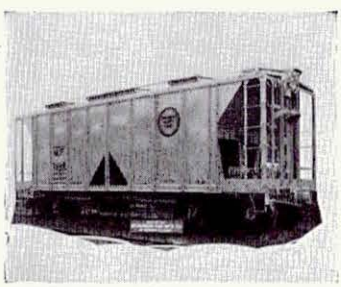


MT. VERNON



MT. VERNON

UFACTURING CO. MT. VERNON, ILLINOIS

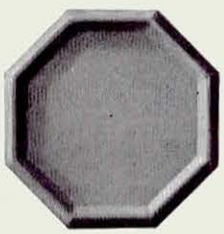
When Steel Castings get back from the war...

They will fit into many new jobs . . . and will be more adaptable for use in the old jobs.

Rigorous tests of war have developed better steel castings . . . for tank armor . . . for gun carriages . . . and other equally severe usages.

The continuous activities of the American Steel Foundries research staff have produced many of these newer compositions in miscellaneous steel castings.

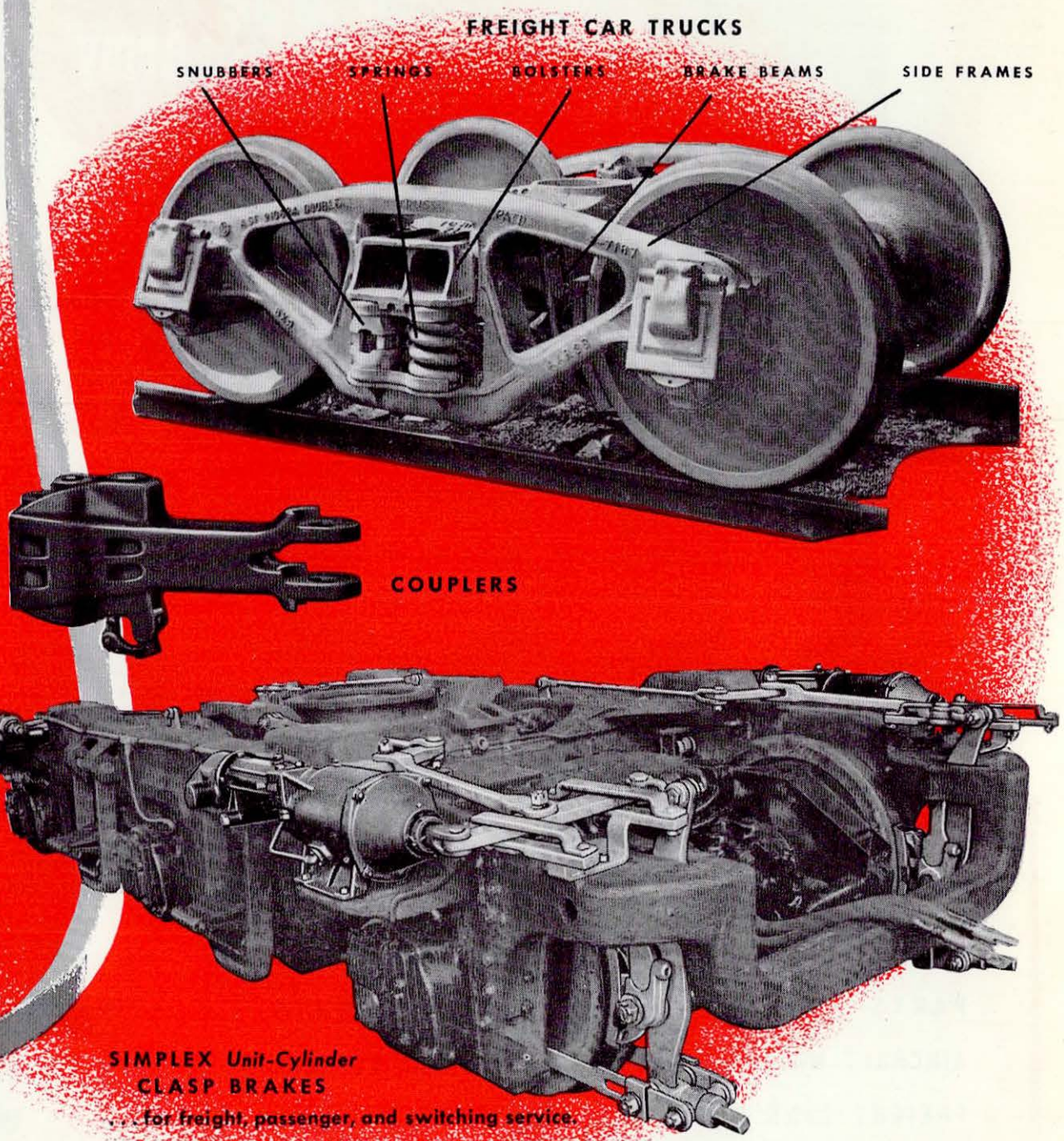
This research work is also being devoted to the production of better freight car parts, clasp brakes and railway specialties which are always major activities of the "Foundries."



The Octagon—symbol of the world's largest producer of steel castings.

AMERICAN STEEL

Even though armament comprises a large percentage of the output of American Steel Foundries, production of railway specialties is being maintained.



FOUNDRIES *Chicago*

Building for the Army.

PULLMAN-STANDARD CAR MANUFACTURING CO.
Built by Pullman

Now in Production

TANKS • HOWITZER CARRIAGES • TRENCH MORTARS
BOMBS • SHELLS OF VARIOUS CALIBERS AND TYPES
PARTS FOR ANTI-AIRCRAFT GUN MOUNTS
AIRCRAFT MAJOR SUB-ASSEMBLIES • NAVAL VESSELS
FREIGHT CARS FOR ARMY, NAVY AND RAILROADS

PULLMAN-STANDARD CAR

CHICAGO • NEW YORK • CLEVELAND • WASHINGTON, D. C.

San Francisco Sales Representative

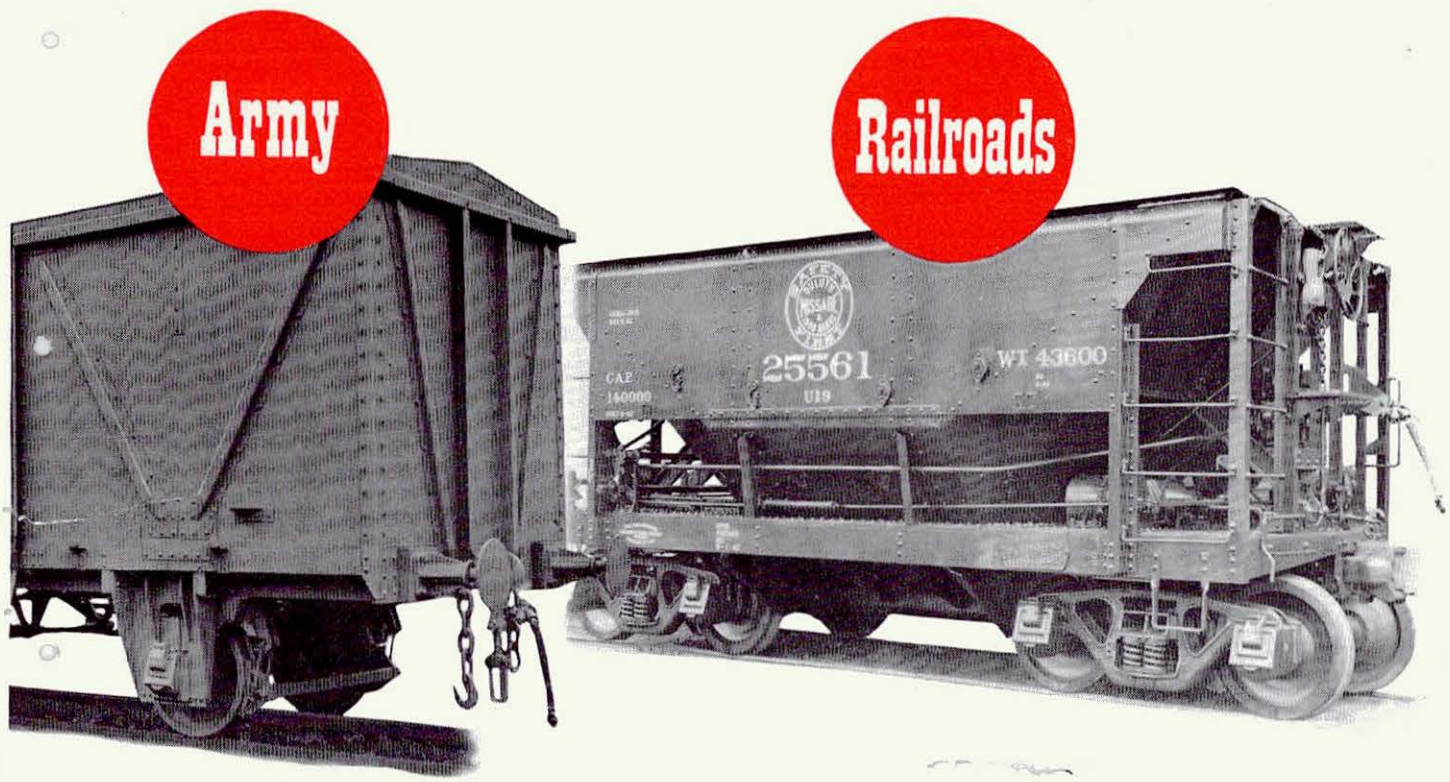
. . for the Navy

and for the RAILROADS

For over eighty years, Pullman-Standard and its predecessors have been building railroad cars . . . and have hung up a record filled with achievement.

To this record is now added the production of immense quantities of war matériel (including freight cars) for the Army and the Navy . . . a job that has again demonstrated the versatility of Pullman-Standard.

But, in addition to a large and diversified volume of war work, this organization is carrying on as a car builder. . . ready to build freight cars for the railroads.

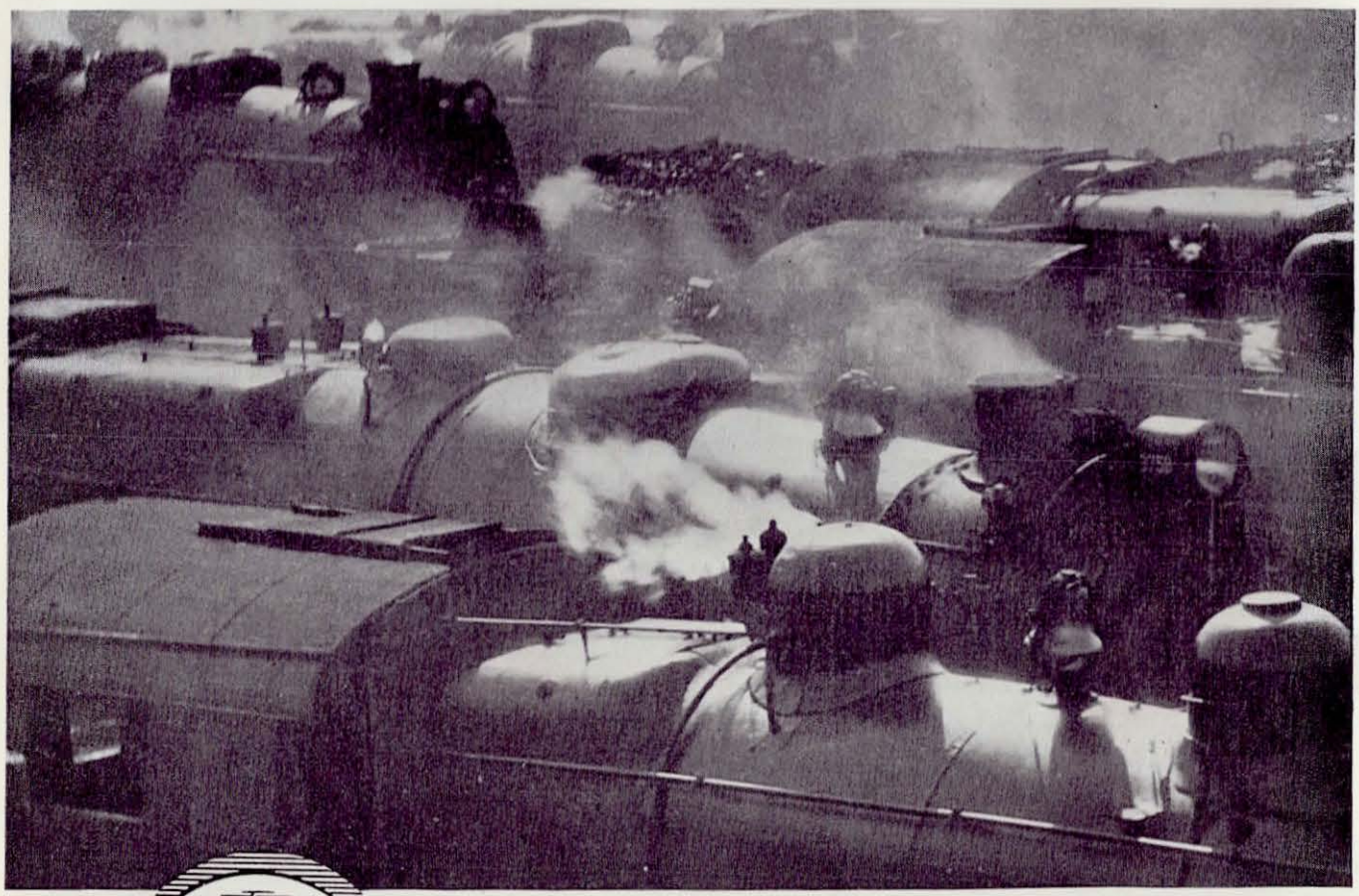


MANUFACTURING COMPANY

PITTSBURGH • BALTIMORE • BIRMINGHAM • WORCESTER, MASS.

Latham McMullin

MID\



THE MIDVALE COMPANY

Offices: New York · · · Chicago · · · Pittsburgh · · ·

would like to say just a word about the Railroads

We are proud, as a Company, of our share in the war effort—proud of the All-Navy "E" with Stars that has been given us. But there must be at the same time a very definite feeling that there are others, equally deserving such awards, who never get them.

The railroads, perhaps more than any other single industry, are as vital to our nation at war as they were vital in peace. At the very time when they are denied essential replacements they are asked to triple their service—and they do it! There is literally not a single thing we ship our boys at the front that could reach them, could even be made, without the railroads.

Some of us realize this today. Let us hope that, when peace again returns, we remember it and give to the railroads the grateful understanding they deserve.

NICETOWN • PHILADELPHIA • PA.

Washington • • • Cleveland • • • San Francisco

ROUTINE ASSIGNMENT—

This is war and well do the American Railroads know it as they accept as a routine assignment their job of transporting huge quantities of men, raw materials and war materiel with unprecedented speed and efficiency.

Dayton V-Belts, too, accept as routine their assignment to deliver constant, dependable and economical power for Diesels, car-lighting and ventilating systems, despite hazards of winter weather and rigorous wartime service conditions.

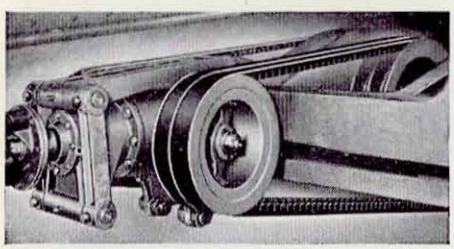
Daytons have what it takes to lengthen battery life—reduce yard recharging and slash maintenance costs all along the line.

But you have in your files what it takes *to conserve* Dayton V-Belt equipment through the proper application and alignment of pulleys—and the regular checking of pulley groove wear. It is Dayton's Catalog No. 65, containing complete instructions for installation, inspection and maintenance of Dayton V-Belt equipment.

If you need still further help in training maintenance crews, analyzing maintenance procedure, or ferreting out any unusual problems concerning V-Belts, the services of Dayton's Maintenance and Inspection Engineers are at your disposal, without cost or obligation.

THE DAYTON RUBBER MFG. CO.
DAYTON, OHIO
Pioneers of Railway V-Belts and Connectors

THROW YOUR SCRAP INTO THE FIGHT!
BUY WAR BONDS AND SAVINGS STAMPS



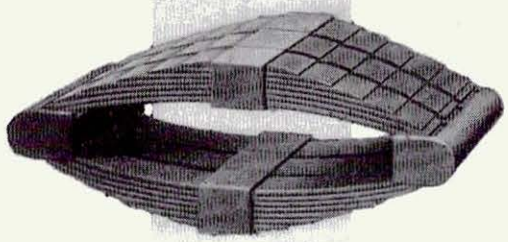
Dayton 2" V-Belt Axle Drive

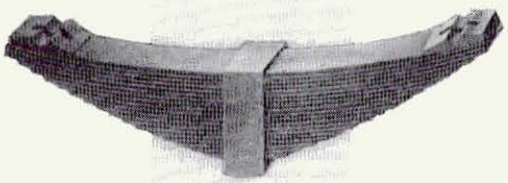
Dayton V Belts

FOR CAR LIGHTING AND AIR-CONDITIONING EQUIPMENT
MADE BY THE WORLD'S LARGEST MANUFACTURER OF V-BELTS

Copyright 1942, The Dayton Rubber Manufacturing Company

READY FOR ACTION ON *Railway Springs*





THE bigger they are the more they require "Railway Springs." Heavier axle loads, higher speeds and constant operation of locomotives all add to the burden of reliable and consistent easy riding springs. "Railway" Springs are manufactured under exacting formulas and high standards of workmanship for just such service. Our engineers will be glad to help you with your spring problems.

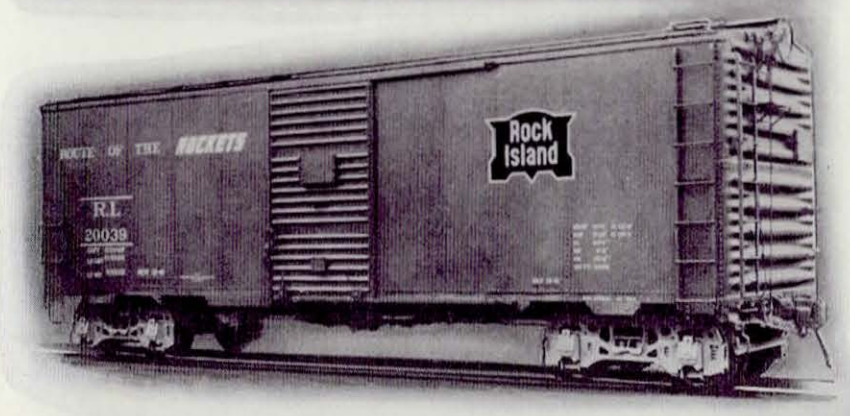
AMERICAN LOCOMOTIVE COMPANY

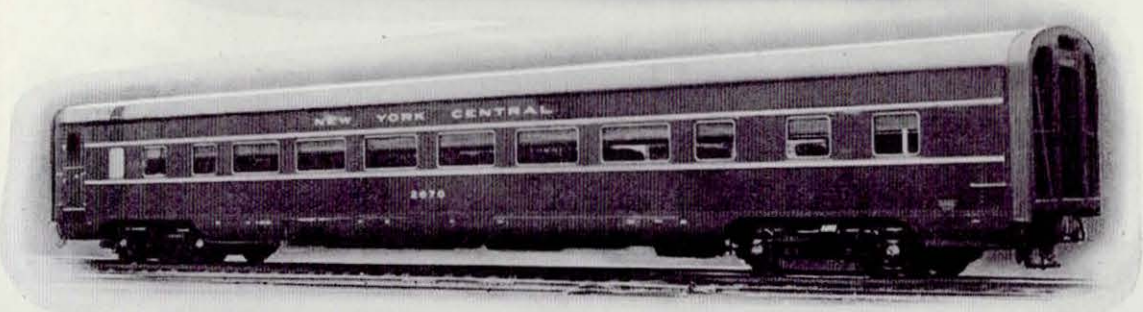
Railway Steel Spring Division

30 CHURCH STREET, NEW YORK, N. Y.

★ Serving t

AT HOME



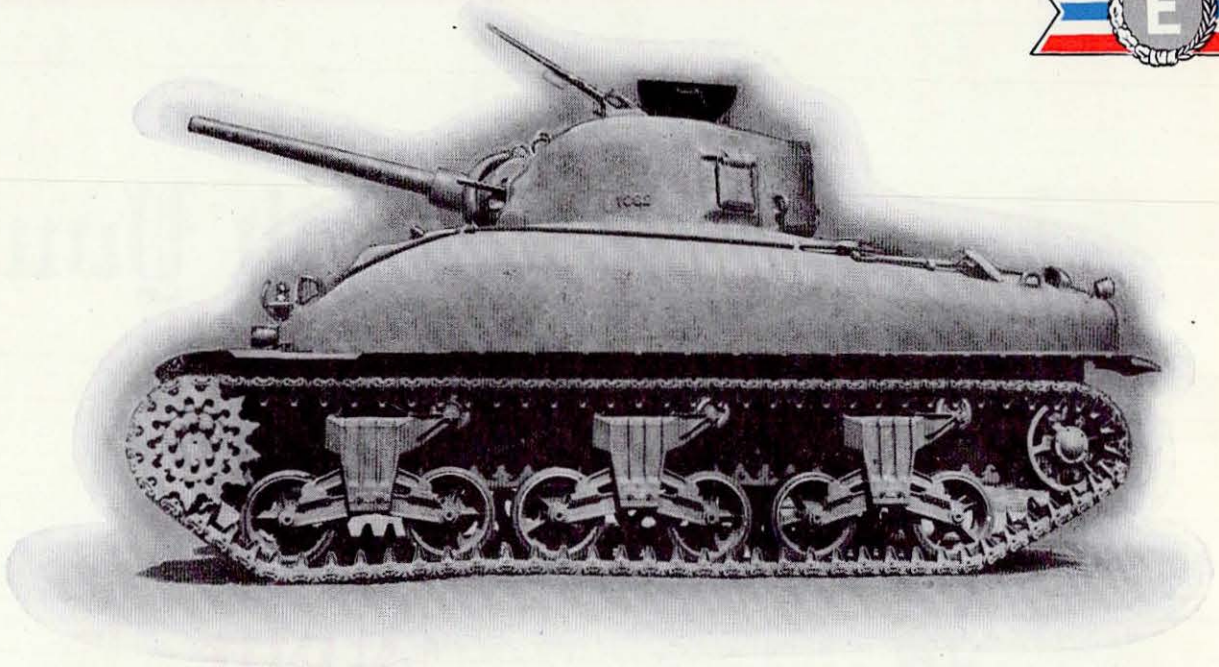


PRESSED Steel Car Company's freight and passenger cars are doing their bit carrying the war materials and commercial traffic of the nation. Over 45 years ago Pressed Steel began producing steel freight cars in quantity, originating a design and method of construction that is the basis of today's highly developed equipment. The first steel passenger car was constructed in 1906, a step that revolutionized the industry.

PRESSED STEEL CAR COMPANY

he Nation ★

AND ABROAD



RIGHT now Pressed Steel Car Company is bending a large share of its energies toward supplying the armed forces with tanks, shells and other ordnance. Because of the immensity of this job they will have a greater capacity to produce more and better railroad equipment after the war. Our vast experience is at your disposal to help solve any problem bearing on the design of steel cars. Pressed Steel Car builds for endurance, economy and safety.

INC., PITTSBURGH, PENNSYLVANIA

In 1943 PEERLESS H-1-B Draft Gear

WILL AGAIN PROVIDE THE BEST PROTECTION FOR CARS AND LADING

We Wish You a Happy New Year

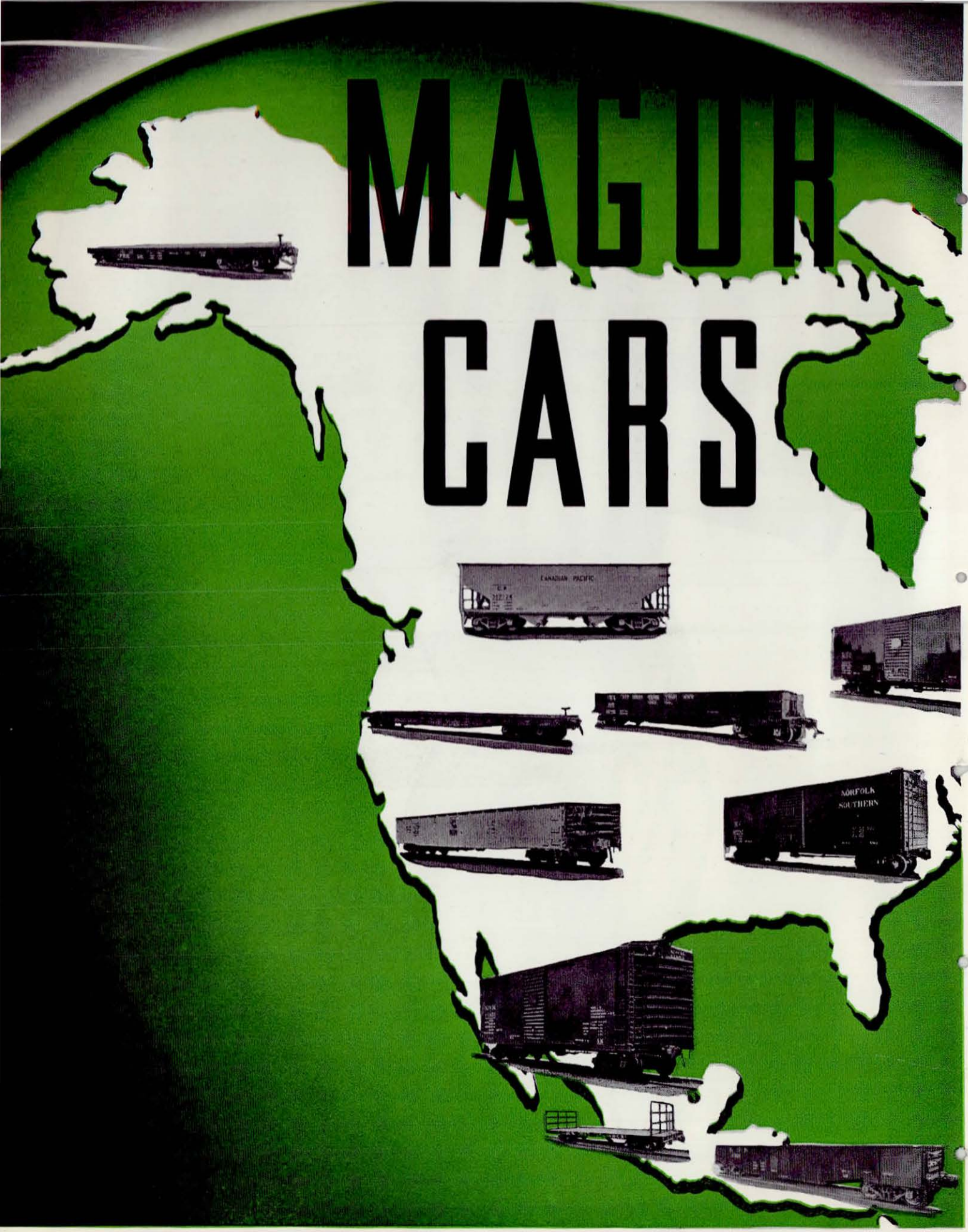
For Victory in '43

BUY U. S. WAR BONDS

PEERLESS EQUIPMENT COMPANY
310 So. Mich. Ave., Chicago, Ill.

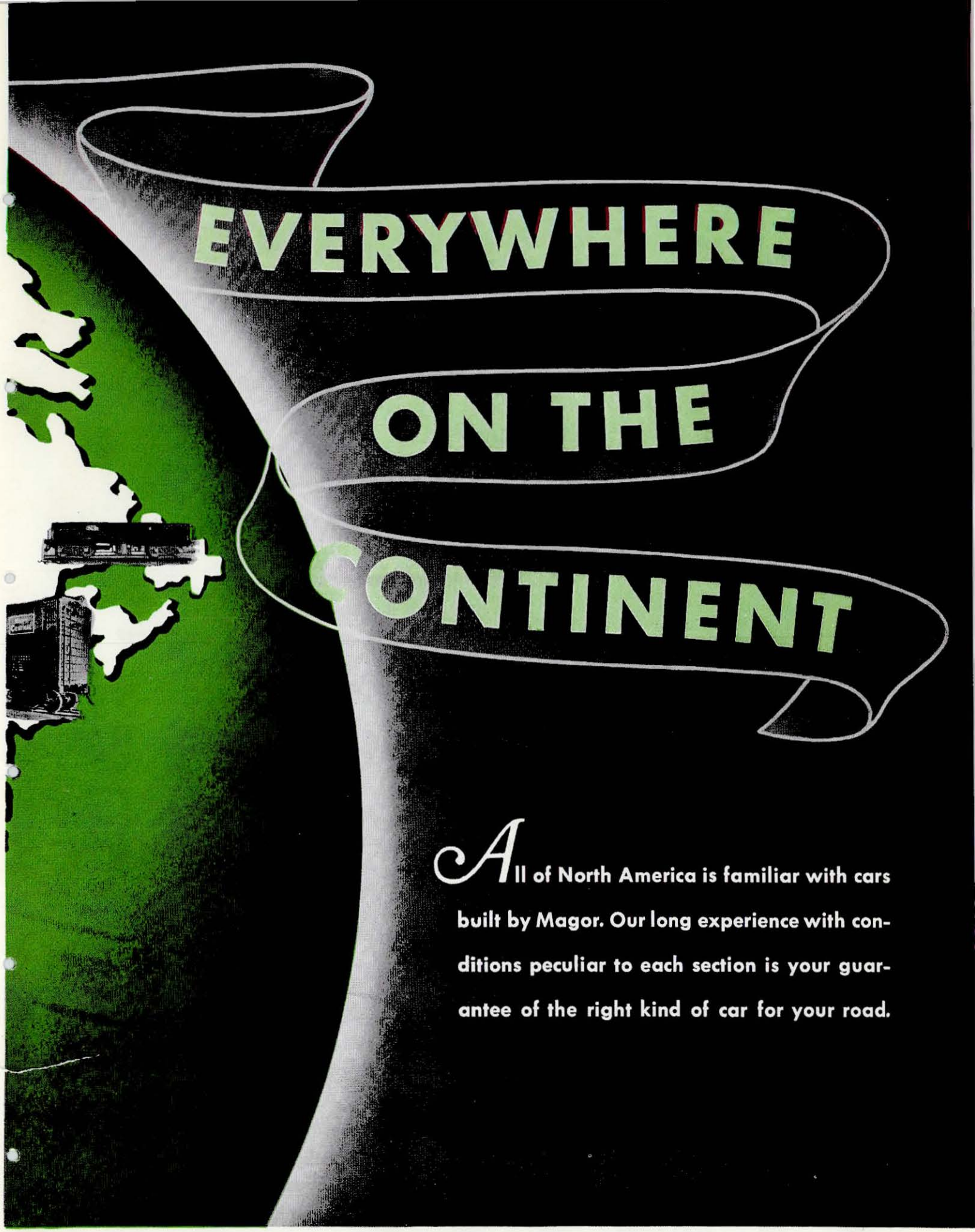
A. A. R.
APPROVED

MAGOR CARS



MAGOR CAR

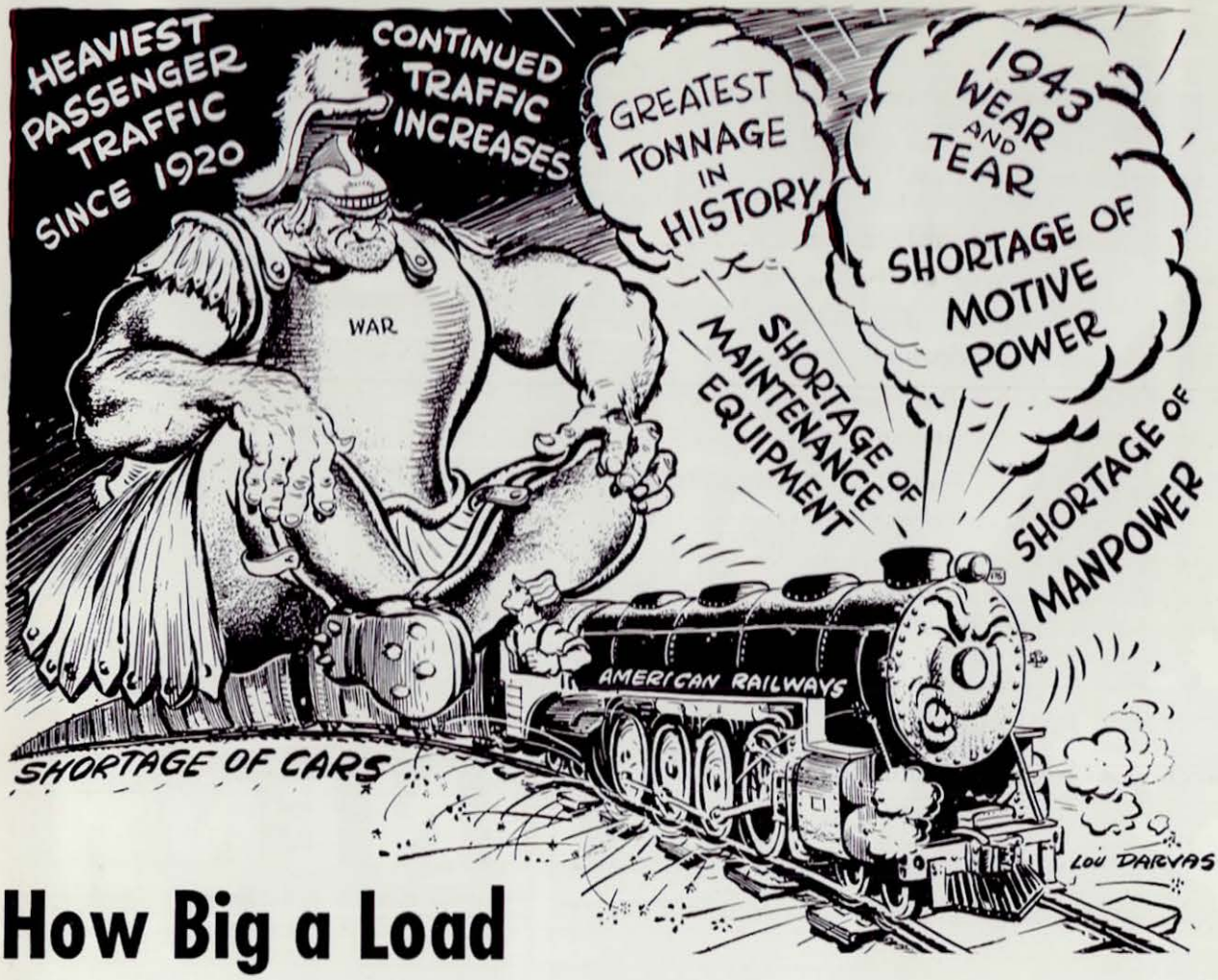
NEW



All of North America is familiar with cars built by Magor. Our long experience with conditions peculiar to each section is your guarantee of the right kind of car for your road.

CORPORATION

YORK



How Big a Load can the Locomotive Handle Before it Stalls?

IN 1942 the Railroads of America handled a volume of traffic that surpassed their best previous performance with comparable equipment and manpower.

Net tonnage handled per train was increased approximately one-tenth, though it appears that somewhat fewer locomotives were on line in 1942.

Last year net ton-miles were increased by 30% and freight-locomotive miles by 20%.

Today, Industry's incredibly big and quick change-over to war production has laid a double burden on the Railroads. The output of Tanks, Planes, Guns and Ships imposes two or more trips by Rail:—

1—Raw materials to manufacturing centers for conversion and processing;

2—Finished products to American Shipyards, Army Camps and Air Fields—and to seaboard enroute to fighting fronts 5,000 miles away.

"Everything Going Out but Little Coming In"

The Roads came through in 1942, but they virtually drained their facilities in doing so.

1—They moved the greatest tonnage in history—averaging 3,600,000 tons of freight a day.

2—They maintained huge troop movements on schedule. In the first 10 months of 1942, the Roads carried 8,000,000 soldiers and sailors—three times the troop volume of World War I.

Total passenger traffic reached a 20-year high.

The Roads will be Obliged to do Even More in 1943

1—Their Manpower has diminished steadily—to 28% less than in 1918.

2—Their rolling stock has been pushed to the limit.

3—Reserves are practically exhausted.

4—Failure of their Maintenance Equipment has exceeded the replacement rate.

Where to Obtain Useable Rolling Stock —Increased Manpower or its Equivalent?

1—Troop movements are due to grow still further in volume and frequency.

2—Highway transport is throttled by the 3-way limitations—rubber, gasoline and speeds.

3—The manufacture of war material certainly will not diminish—it probably will increase.

4—Curtailment in the consumption of civilian goods in America may mean diversion of civilian goods to our Allies—throwing a still heavier transportation burden on the Railroads.

If More Bricks—then More Straw!

The fact that the Roads have done a masterful job is no indication they can continue indefinitely.

For in the broadest sense, the Railroads are Manufacturers. They are creators and suppliers of Transportation, which is just as essential to Victory as Production is.

Yet today, Railroads cannot compete with other Industries for all their supplies—they cannot get the rating necessary to secure all shop and freighthouse equipment so sorely needed.

Must Railroads Become the Bottleneck when Ships are Available?

If they do, who is to assume the responsibility?

Ships and More Ships will be available in 1943. How to deliver the tremendous quantities of goods stored across the country waiting for ships? Only the Railroads can do it. If with fewer cars and locomotives than requested, then those available must travel faster and longer between repairs—wearing out sooner.

With manpower siphoned off to war, each man left must be situated to do more; and that means equipment to multiply manpower to effect repairs more quickly and to return rolling stock to service.

And What About the Long Pull?

Even more than other American Industries, the Railroads may face critical new problems at the war's end. How successful they may be in meeting those problems can depend on their physical condition when that day comes.

Elwell-Parker Knows the Transportation Business Too

The first Elwell-Parker Trucks and Cranes were built for Railroads—resulting in a close kinship and knowledge of railroading problems.

Elwell-Parker Trucks and Cranes are "factory railroads." They bring in raw materials; they move them along through the successive stages of production or processing; they transport the finished goods to warehouse or delivery dock.

As manufacturers of Power Industrial Trucks and Cranes—and as advocates of cost-reducing methods of material-handling—The Elwell-Parker Electric Company shares in many of the Railroads' vital problems.

We are aware of the outstanding records established by Elwell-Parker Equipment through many years' operation in Railroad Shops, Roundhouses, Terminals and Warehouses, and Stores Departments.

In common with the Railroads, it is our business to help manufacturers to devise and maintain facilities for moving the greatest volume of materials—at the highest speed—with the greatest economy of manpower—with full regard for safety—and at the lowest possible cost.

- We believe that practical assistance enabling the Railroads to maintain their reserves of Equipment and Facilities is one of the greatest National interests at this time.

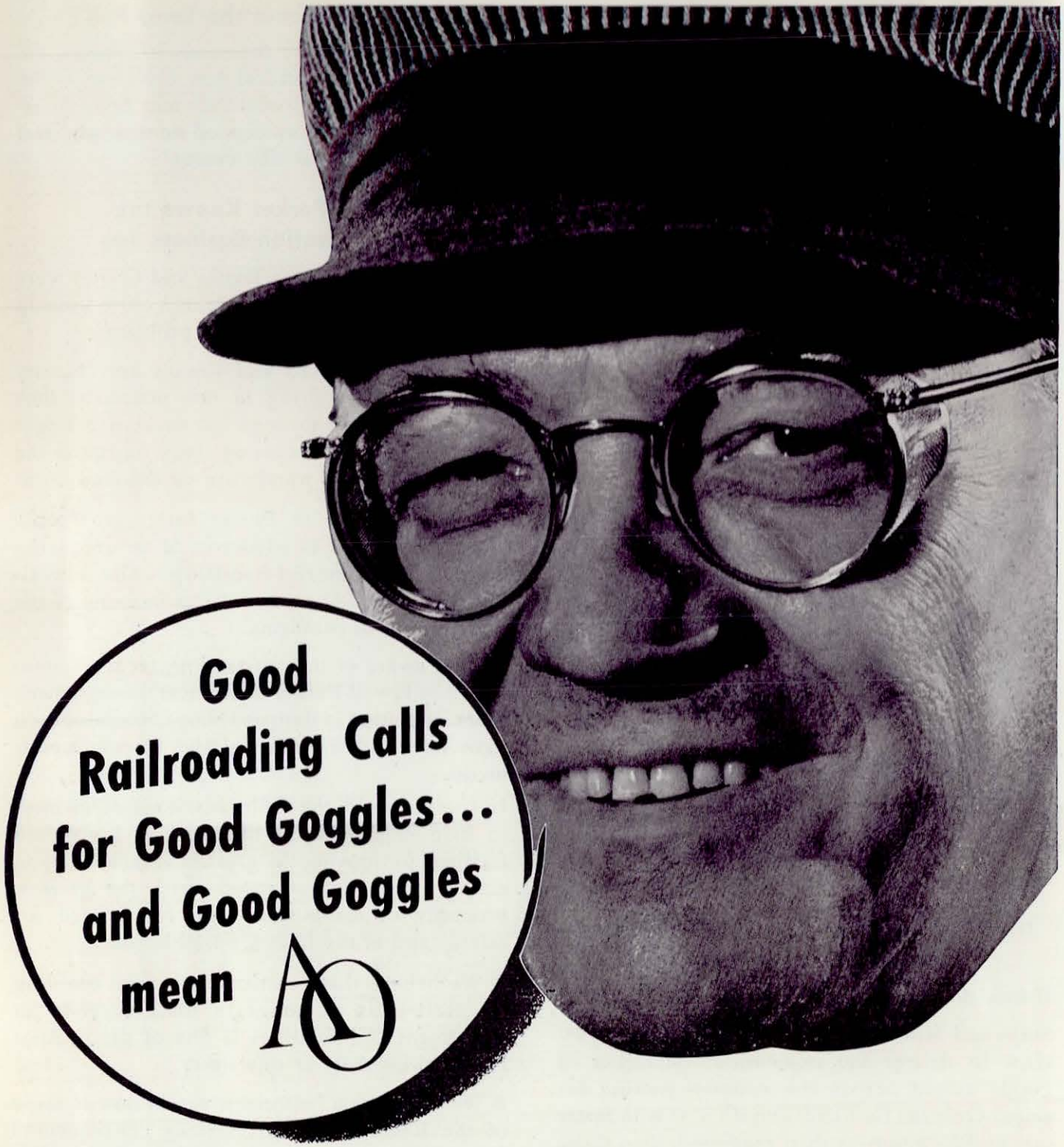
- We believe that reasonable action now in favor of the Roads may avert serious consequences soon—that it may ease the load in time, before the "Locomotive" actually stalls.

- And we believe that such Prevention is the most practical kind of Foresight.

The Elwell-Parker Electric Company, 4250 St. Clair Avenue, Cleveland, Ohio.

ELWELL-PARKER *Power Industrial* TRUCKS

ESTABLISHED 1893 • BUILDING POWER INDUSTRIAL TRUCKS SINCE 1906



It is good railroading to keep eye accidents out of a System with good goggles. And today, when every worker in every department—mechanical, electrical, signal, train service and maintenance—is needed for your railroad's *toughest job,* good American goggles are more necessary now than ever before.

American Optical Company, pioneer developers of products to aid and protect vision, offers you just the right goggles for every type of eye hazard in railroading. AO Goggles are designed for safety and comfort. Equipped with Deep-Curved Super Armorplate Lenses, they offer greater resistance to impact.

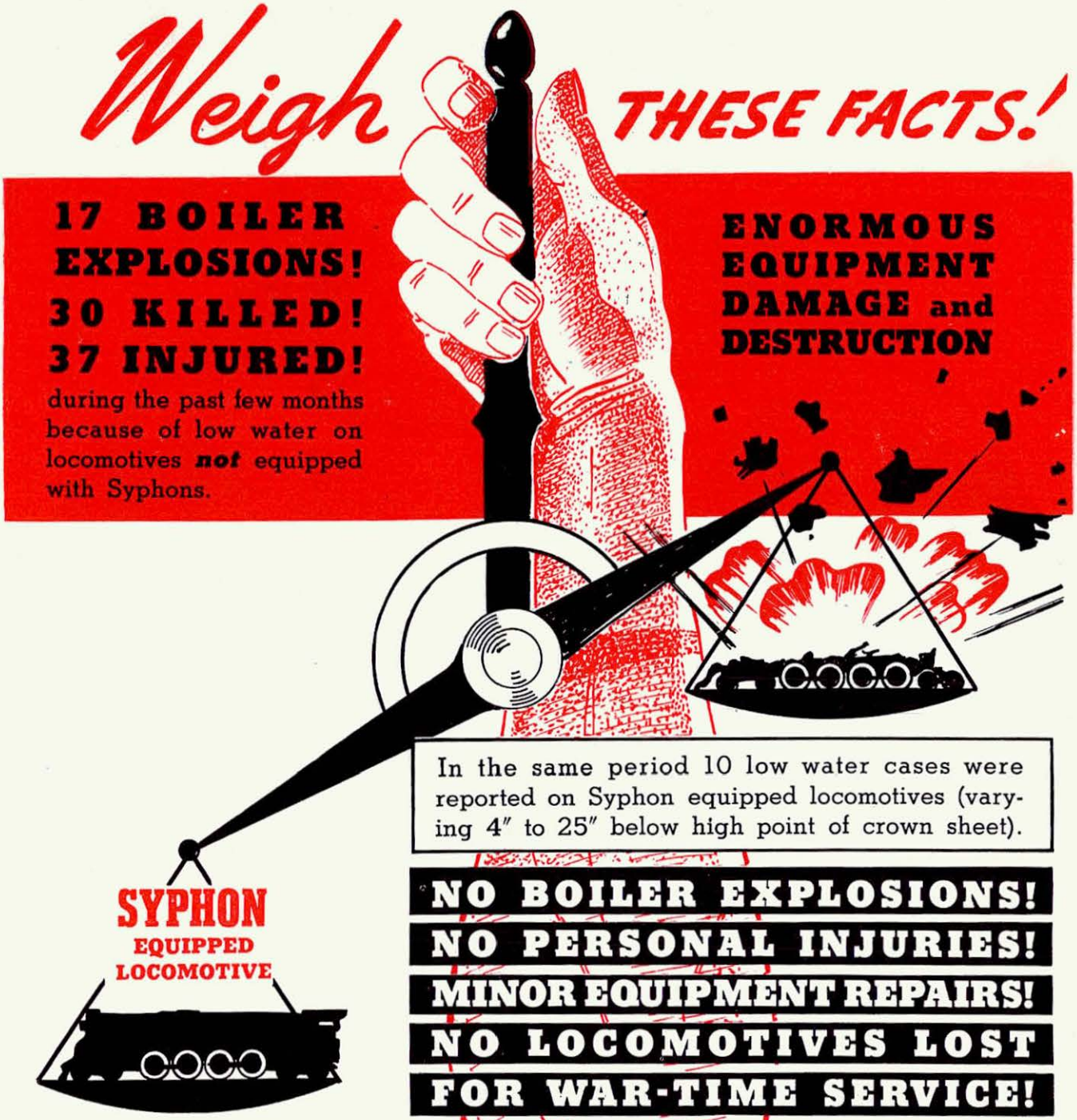
THE American Optical COMPANY

SOUTHBRIDGE MASSACHUSETTS

Weigh THESE FACTS!

17 BOILER EXPLOSIONS!
30 KILLED!
37 INJURED!
during the past few months because of low water on locomotives ***not*** equipped with Syphons.

ENORMOUS EQUIPMENT DAMAGE and DESTRUCTION



In the same period 10 low water cases were reported on Syphon equipped locomotives (varying 4″ to 25″ below high point of crown sheet).

SYPHON EQUIPPED LOCOMOTIVE

NO BOILER EXPLOSIONS!
NO PERSONAL INJURIES!
MINOR EQUIPMENT REPAIRS!
NO LOCOMOTIVES LOST FOR WAR-TIME SERVICE!

Caution to Enginemen:
Enginemen should note that when a locomotive is working, an interruption of only 5 to 10 minutes in the injection of water into the locomotive boiler is sufficient to create a dangerous low water hazard!

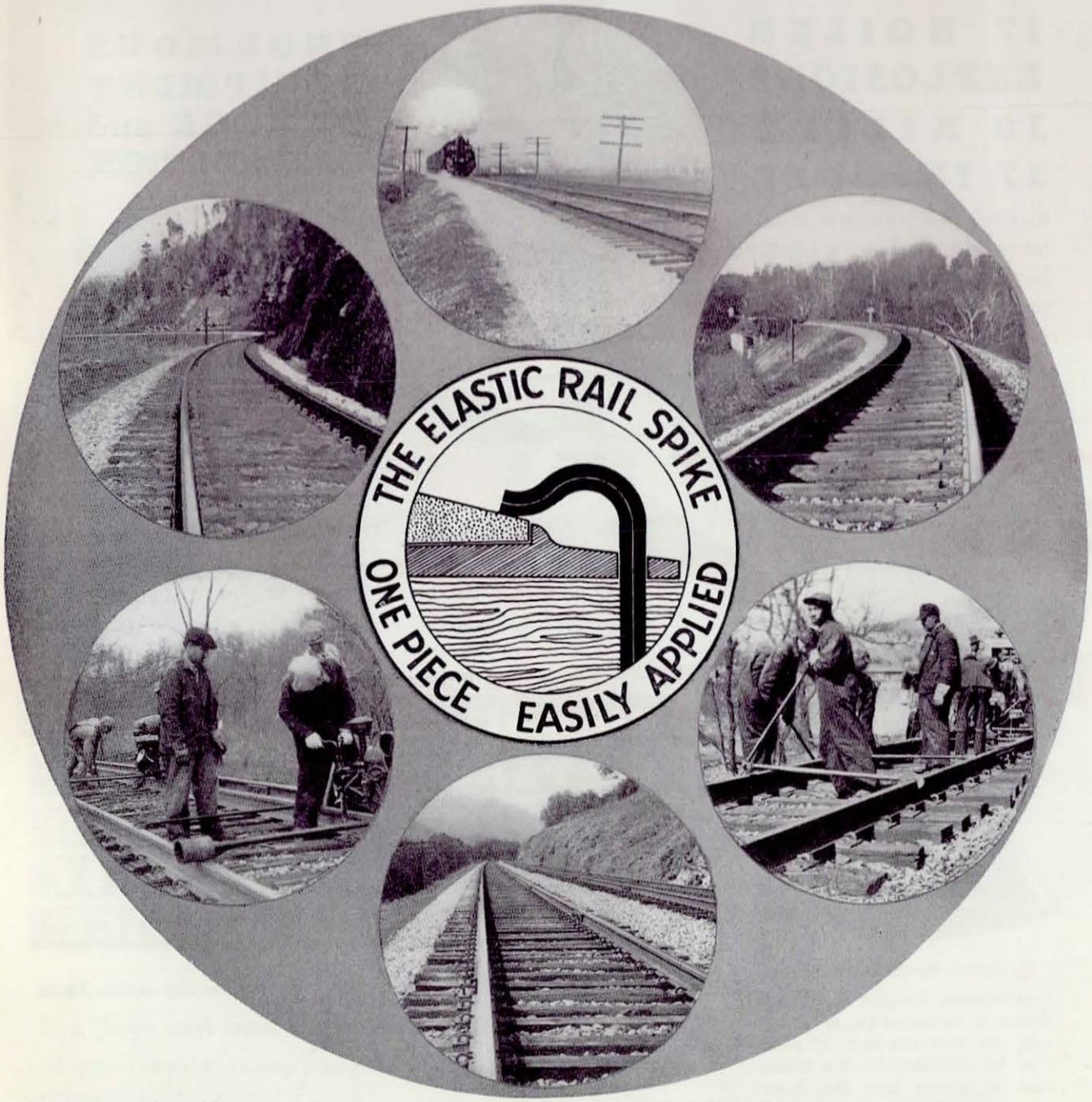
SYPHONS produce more boiler capacity with ***less weight, less steel, less labor and less cost,*** and for equivalent results assure greater economy in service and maintenance than larger boilers without SYPHONS, ***plus safety from boiler explosion.***

Locomotive Firebox Company

NEW YORK CHICAGO MONTREAL

Elastic RAIL SPIKE

BETTER TRACK AT LOWER COST



Eliminates spike-killing
Lowers maintenance costs
Adapted to existing track standards

Simple design — saves steel
Tie plate abrasion reduced
Improved ability to maintain gauge

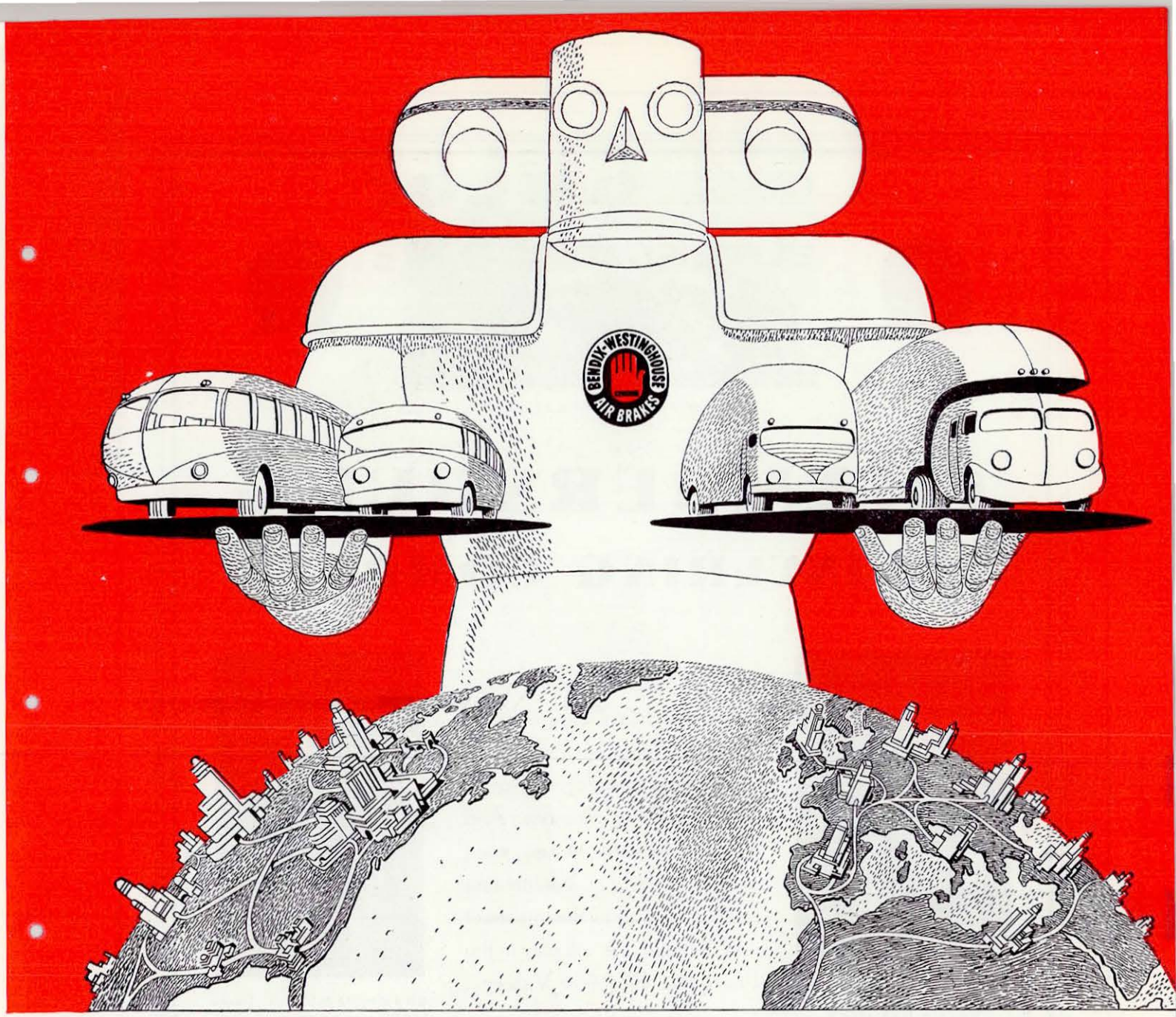
Checks rail-creepage — both directions

ELASTIC RAIL SPIKE CORPORATION

Affiliate of Bernuth, Lembcke Co., Inc.

420 LEXINGTON AVENUE, NEW YORK

New York Pittsburgh Houston London

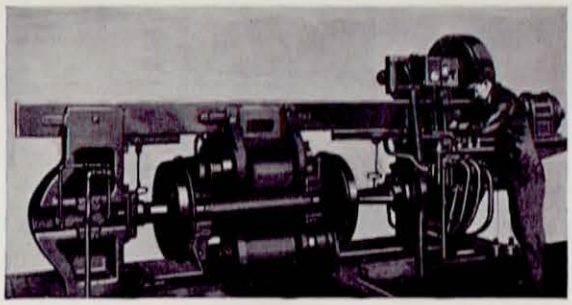


... IN TIME OF WAR PREPARE FOR PEACE

Unpredictable as the future may seem, peace will come . . . It always has! And in its wake will follow complexities to overshadow our current difficulties ★ It behooves us then to put to work the lessons a belligerent world has forced upon us ★ Certainly now is the time to see that every piece of rolling equipment is brought up to its highest peak of efficiency. And since modernizing Brake Control is one of the quickest, relatively inexpensive and surest ways of accomplishing this end, it seems logical that Bendix-Westinghouse should play an important part in your present program of rehabilitation ★ Of this you may be certain . . . it is traditional that whatever your plan or schedule, you'll find Bendix-Westinghouse and a nationwide organization of Authorized Distributors ready to serve you. Here you will also find an intelligent understanding of your most complex control problems backed by a scientific research which assures you a world standard of safety, in war as in peace.

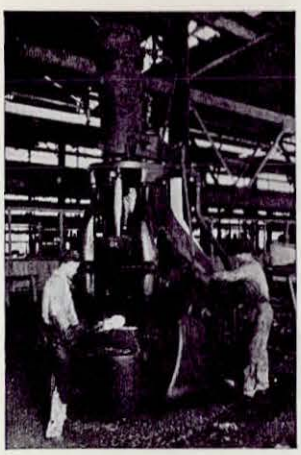
BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE CO.
ELYRIA, OHIO

AN ORGANIZATION WHOSE UNDIVIDED EFFORT AND COMPLETE RESOURCES ARE DEVOTED TO YOUR CONVENIENCE AND SAFETY



CHAMBERSBURG WHEEL PRESSES

CHAMBERSBURG
ENGINEERING COMPANY



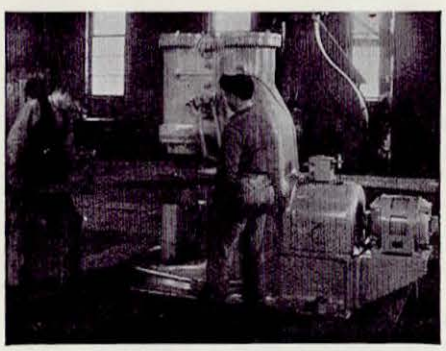
CHAMBERSBURG SINGLE FRAME HAMMERS

Celebrating its 45th year, Chambersburg Engineering Company looks back with pride on a long record of service to the railroads of America. And it looks forward to an even greater future . . . contributing to Victory, and to the important role the railroads will play in the Peace that will follow Victory...

CHAMBERSBURG HYDRO-PNEUMATIC BUSHING PRESSES

CHAMBERSBURG • • • • PENNSYLVANIA

STEAM DROP HAMMERS
STEAM FORGING HAMMERS
PNEUMATIC FORGING HAMMERS
BOARD DROP HAMMERS
CECOSTAMPS
HYDRAULIC PRESSES



CHAMBERSBURG PNEUMATIC FORGING HAMMERS

TRIMMING PRESSES
DRIVING WHEEL PRESSES
CAR WHEEL PRESSES
HYDRAULIC PUMPS
ACCUMULATORS
SPECIAL MACHINERY
IRON CASTINGS

To— Save labor

To— Save tie wear

To— Save rail wear

The Improved Fair is the Answer

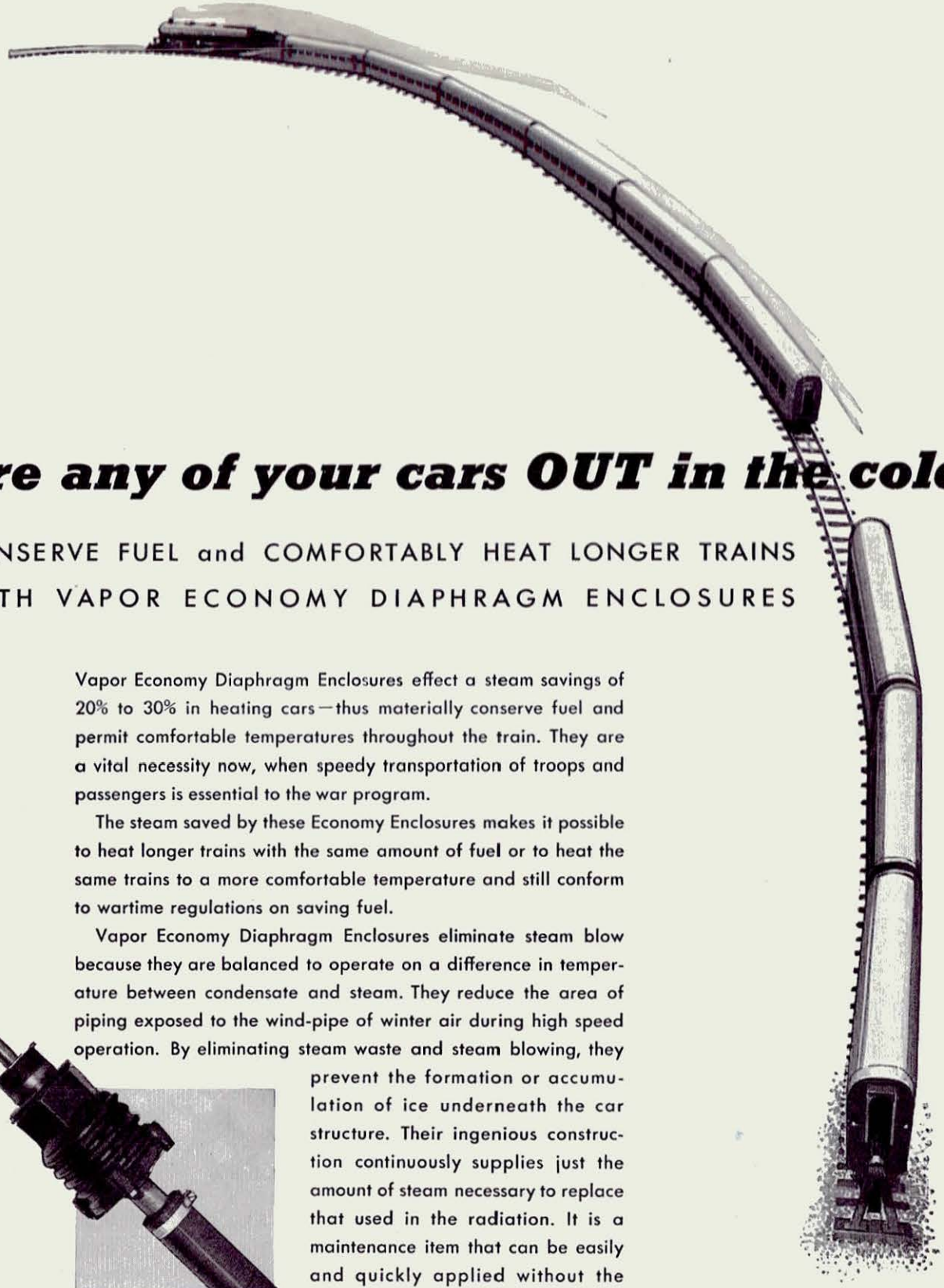
One piece—simple—and costs only a fraction of a cent to apply, saving labor.

12½ sq. inches of bearing and adaptable contacts, saving ties.

Maintains better track alignment, saving rail.

THE P. & M. CO.

CHICAGO · NEW YORK · DENVER · CLEVELAND · ST. LOUIS · WASHINGTON · SAN FRANCISCO · ST. PAUL · BOSTON



are any of your cars OUT in the cold?

CONSERVE FUEL and COMFORTABLY HEAT LONGER TRAINS WITH VAPOR ECONOMY DIAPHRAGM ENCLOSURES

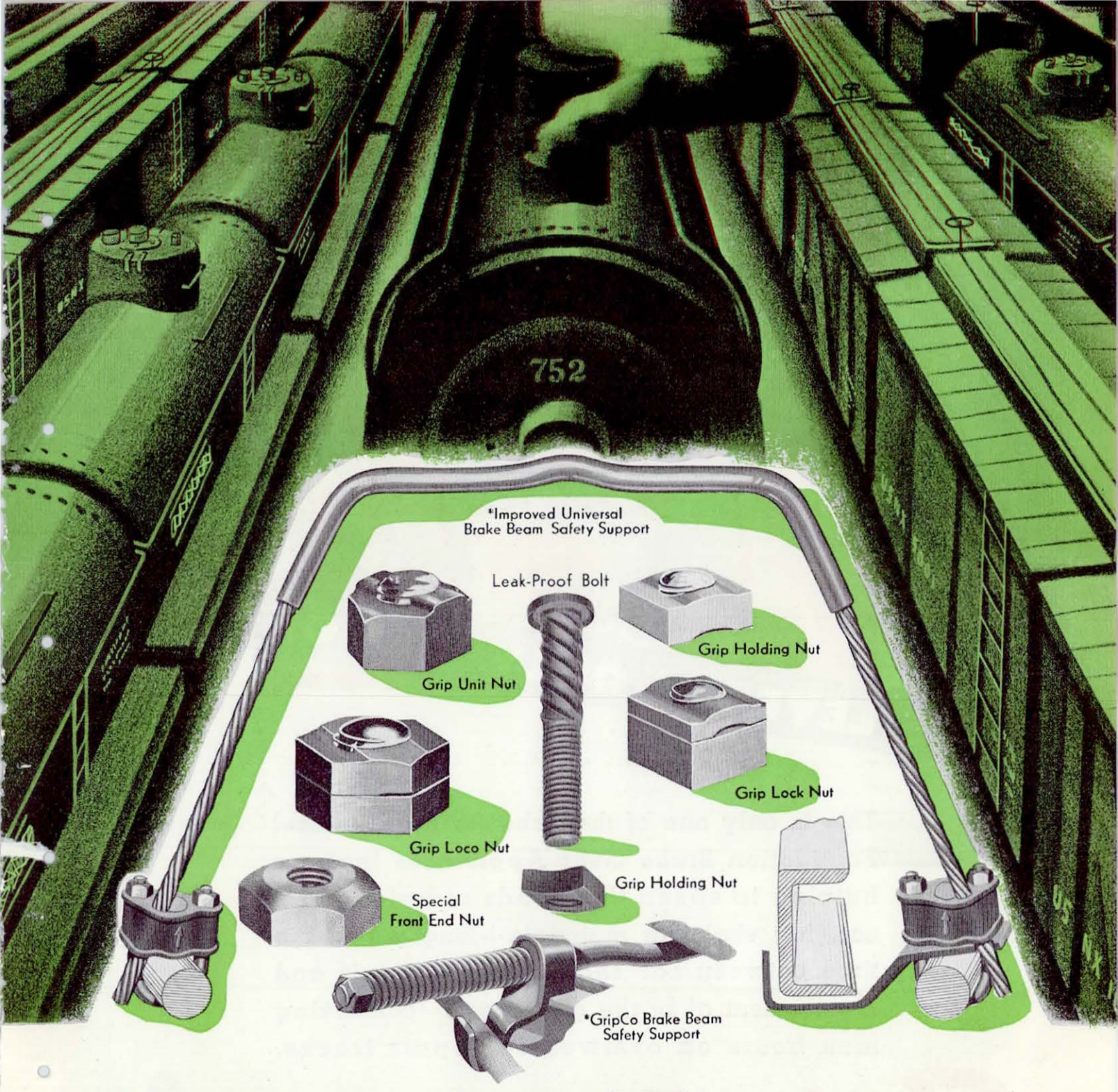
Vapor Economy Diaphragm Enclosures effect a steam savings of 20% to 30% in heating cars—thus materially conserve fuel and permit comfortable temperatures throughout the train. They are a vital necessity now, when speedy transportation of troops and passengers is essential to the war program.

The steam saved by these Economy Enclosures makes it possible to heat longer trains with the same amount of fuel or to heat the same trains to a more comfortable temperature and still conform to wartime regulations on saving fuel.

Vapor Economy Diaphragm Enclosures eliminate steam blow because they are balanced to operate on a difference in temperature between condensate and steam. They reduce the area of piping exposed to the wind-pipe of winter air during high speed operation. By eliminating steam waste and steam blowing, they prevent the formation or accumulation of ice underneath the car structure. Their ingenious construction continuously supplies just the amount of steam necessary to replace that used in the radiation. It is a maintenance item that can be easily and quickly applied without the necessity of any change in piping.

VAPOR CAR HEATING CO., INC.

80 EAST JACKSON BLVD. CHICAGO, ILLINOIS



Grip-nut, too, is serving!

Rail transport is the life-line of this embattled nation. American railroads are meeting magnificently the challenge of tremendous requirements of wartime mass-transportation. To maintain and increase the pace, rolling stock and power must stay in uninterrupted, efficient operation. Continuous, dependable service is vital to the support of our far flung armed might and our civilian economy.

GRIP NUT COMPANY products play an ever increasing part in this effort. Car building, maintenance and repair executives know and prefer them, because GRIP NUT products keep cars in service and off repair tracks.

GRIP NUT COMPANY exclusive, patented features; strength with minimum weight; simple, positive application — are on guard wherever loads roll on steel rails.

GRIP NUT COMPANY engineers are available for consultation at all strategic rail-centers, carshops and repair yards.

Complete information on all GRIP NUT COMPANY products, descriptive literature and samples will be supplied upon request.

GRIP NUT
COMPANY
310 SOUTH MICHIGAN AVENUE
CHICAGO, ILLINOIS

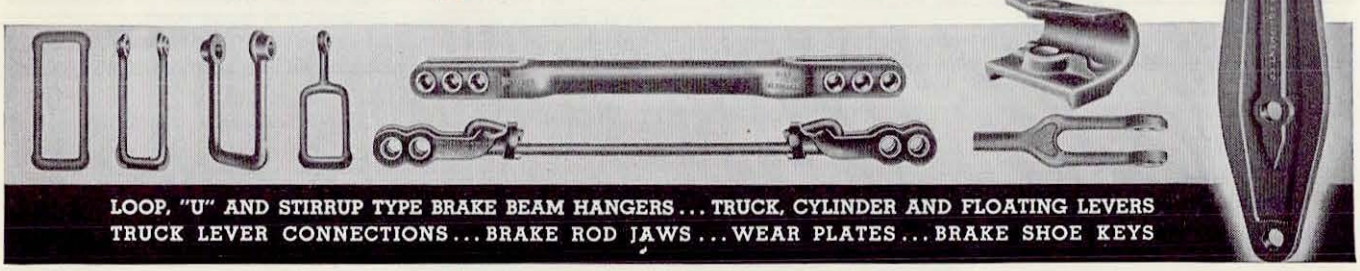
**A. A. R. approved equivalent design*

THIS LEVER IS ONLY ONE OF SIX–

This is only one of the Schaefer Forged Steel Foundation Brake Gear Appliances that are helping to speed thousands of freight cars carrying vital war materials — lengthening the time between car shoppings for repair and replacement of brake gear parts — conserving man hours on overworked repair tracks.

Schaefer EQUIPMENT COMPANY

KOPPERS BUILDING • PITTSBURGH, PA.



LOOP, "U" AND STIRRUP TYPE BRAKE BEAM HANGERS ... TRUCK, CYLINDER AND FLOATING LEVERS
TRUCK LEVER CONNECTIONS ... BRAKE ROD JAWS ... WEAR PLATES ... BRAKE SHOE KEYS

We congratulate and salute the railroads of America for their outstanding performance during the war year

1942

YOUNGSTOWN STEEL DOOR COMPANY

CLEVELAND • CHICAGO • NEW YORK • YOUNGSTOWN

G. R. CO.
ARCH BRICK

Arch Brick on the drying floor of our Orviston plant.

ICTOR ON THE HOTTEST FRONT

YOU have got to keep 'em hot if you expect to keep 'em rolling.

That constant, high steam pressure and maximum boiler capacity can't be obtained without a complete brick arch.

Consistent long service on a hot front naturally indicates superior qualities and workmanship.

That's what the "G.R.Co." imprint on an arch brick stands for.

Our 21 Plants, working day and night, are turning out all kinds of vital refractory products.

We are at your service.

GENERAL REFRACTORIES COMPANY

Philadelphia RAILWAY DEPARTMENT Penna.

Orders for TIMKEN RAILROAD BEARINGS Delivered or Received During 1942

[Up to Dec. 14, 1942]

Baltimore & Ohio Railroad
- 1 - Steam Locomotive, type 4-8-2, *conversion*—All Driving Axles and Trailer.
- 1 - Tender—*conversion*—8 Wheel Type.

Canadian National Railways
- 35 - Steam Locomotives, type 4-8-4, *new*—Engine Truck and Trailer Truck.

Chesapeake & Ohio Railway
- 10 - Steam Locomotives, type 2-6-6-6, *new* — All Driving Axles and Engine Truck.
- 8 - Steam Locomotives, type 4-6-4, *new*—Complete all Axles.
- 8 - Tenders—12 Wheel Type.

Chicago & North Western Railway
- 4 - Steam Locomotives, type 4-8-4, *conversion*—Complete all Axles.
- 12 - Steam Locomotives, type 4-8-4, *conversion*—Trailer Truck.

Chicago, Burlington & Quincy Railroad
- 4 - Steam Locomotives, type 4-8-4, *conversion* — Timken Light Weight Parts.
- 5 - Steam Locomotives, type 2-10-4, *conversion* — Engine Truck.
- 9 - Tenders, *conversion*—12 Wheel Type.

Chicago, Rock Island & Pacific Railway
- 14 - Steam Locomotives, type 2-8-2, *conversion*—All Driving Axles.
- 8 - Passenger Cars—*conversion.*
- 8 - Tenders—*conversion*—12 Wheel Type.

Chicago, South Shore & South Bend Railroad
- 5 - Passenger Cars.

Chile Exploration Company
- 50 - 70 Ton Freight Cars.

Clinchfield Railroad
- 8 - Steam Locomotives, type 4-6-6-4, *new* — Complete All Axles.

Denver & Rio Grande Western Railroad
- 5 - Steam Locomotives, type 4-6-6-4, *new*—All Driving Axles.
- 5 - Tenders—14 Wheel Type.

Duluth, Missabe & Iron Range Railway
- 10 - Steam Locomotives, type 2-8-8-4, *new*—All Driving Axles.

Grand Trunk Western Railway
- 25 - Steam Locomotives, type 4-8-4, *new*—Engine Truck and Trailer Truck.
- 25 - Tenders—12 Wheel Type.

Louisville & Nashville Railroad
- 14 - Steam Locomotives, type 2-8-4, *new*—Complete All Axles.
- 14 - Tenders—12 Wheel Type.
- 1 - Steam Locomotive, type 4-6-2, *new*—Engine Truck and Trailer Truck.

Missouri Pacific Railroad
- 15 - Steam Locomotives, type 4-8-4, *new*—Complete All Axles.
- 1 - Steam Locomotive, type 4-6-2, *conversion* — Timken Light Weight Parts.
- 2 - Steam Locomotives, type 2-8-2, *conversion* — Timken Light Weight Parts.

Nashville, Chattanooga & St. Louis Railway
- 10 - Steam Locomotives, type 4-8-4, *new*—Complete All Axles.
- 10 - Tenders—12 Wheel Type.

New York Central System
- 25 - Steam Locomotives, type 4-8-2, *new*—All Driving Axles and Trailer Truck—Timken Light Weight Parts.
- 67 - Passenger Cars. (Including New Empire State Express.)

New York, New Haven & Hartford Railroad
- 10 - Diesel Electric Locomotives, type 0-6-6-0, *new* — All Axles.

Norfolk & Western Railway
- 10 - Steam Locomotives, type 2-6-6-4, *new*—Complete All Axles.
- 10 - Steam Locomotives, type 2-8-8-2, *conversion*—Complete All Axles.

Northern Pacific Railway
- 12 - Steam Locomotives, type 4-6-6-4, *new* — Complete All Axles.
- 10 - Steam Locomotives, type 4-8-4, *new*—Complete All Axles.
- 22 - Tenders—14 Wheel Type.

Pennsylvania Railroad
- 27 - Steam Locomotives, type 4-6-2, *conversion*—Engine Truck.
- 6 - Electric Locomotives, type 4-6-6-4, *new*—Complete All Axles.
- 50 - Tenders—16 Wheel Type.

Phelps Dodge Corporation
- 140 - 90 Ton Freight Cars.

Pullman Company
- 258 - Car Sets for *new* Pullman Cars.

St. Louis Southwestern Railway
- 5 - Steam Locomotives, type 4-8-4, *new*—Complete All Axles.
- 5 - Tenders—12 Wheel Type.

Southern Pacific Company
- 1 - Steam Locomotive, type 4-8-4, *new*—Complete All Axles.
- 1 - Tender—12 Wheel Type.

Union Pacific Railroad
- 26 - Steam Locomotives, type 4-6-6-4, *new*—All Driving Axles.
- 26 - Tenders—14 Wheel Type.

Wabash Railroad
- 5 - Steam Locomotives, type 4-6-4, *new*—Complete All Axles.

War Department
- 143 - Freight Cars, Miscellaneous Types.

Wheeling & Lake Erie Railway
- 10 - Steam Locomotives, type 2-8-4, *new*—Complete All Axles.
- 5 - Steam Locomotives, type 2-8-2, *conversion* — Trailer Trucks.
- 10 - Tenders—12 Wheel Type.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

Breakdown of totals for Timken Bearing equipment listed:

Steam Locomotives		323
Timken Bearing Driving Axles on	213	
Timken Bearing Engine Trucks on	225	
Timken Bearing Trailer Trucks on	226	
Timken Light Weight Reciprocating Parts on	32	194
Tenders		258
Pullman Cars		80
Passenger Cars		333
Freight Cars		10
Diesel Locomotives (all axles)		6
Electric Locomotives (all axles)		1,204
Total Locomotives and Cars		

"All There Is In Bearings"

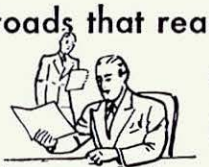
TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
RAILWAY ROLLER BEARINGS

This is what railroads are made of...

A "Railroad" is a smooth-working combination of men and machinery—combining close team work with technical ability and the experience of years of transporting people and products of the nation. A "Railroad" is not simply a "company" or "corporation" at work—it is thousands upon thousands of men whose very lives, and often the lives of their fathers and their children, are dedicated to the task of maintaining and improving America's lines of transportation—lines that reach out to the front lines of the world's far-flung battle fields.

UNARCO CONSERVING THE VITAMINS OF THE RAILROAD . . . B.T.U.'S UNARCO

Insutape and Wovenstone Heat Insulation provide advantages to the Railroads that reach into virtually every department. The increased comfort afforded passengers riding in properly heated coaches is a distinct advantage recognized by executive and operating officers. Ease of application and reapplication appeals to mechanical and maintenance men. Insutape and Wovenstone are economical as well as efficient insulations—can be used over and over again without losing their initial efficiency and will not shake down, always remaining snug and firm against the pipe. Traffic men find that Insutape and Wovenstone are helping the Railroads perform their magnificent job of transporting men and materials to key points throughout the country.



UNION ASBESTOS & RUBBER CO.

310 S. MICHIGAN AVE., CHICAGO • NEW YORK • SAN FRANCISCO

ARMY E NAVY THE ARMY-NAVY "E" AWARDED TO THE PATERSON, N. J. PLANT FOR EXCELLENCE IN WAR PRODUCTION

HOW TO STEP UP "READER INTEREST" IN WAR-TIME ADVERTISING

Third Supplement to "A Guide to Effective War-Time Advertising" Shows Advertising that Business Paper Readers Applaud

THE business paper reader today is acutely aware of the value of the time he spends searching through his "bible" for helpful ideas. For his money, the only advertising that is helping to fight the war is that which helps him solve his war-time problems. And for your money, advertising that helps with current problems is the kind that will do the most effective job of building a sound foundation for future business.

Readers Spot "Phonies"

Our recent field work reveals that business paper readers appreciate the trend to instructive, informative copy. However, as may be expected, the readers spot phonies much faster than we do. They know when the ad really aims at a *current problem,* or when it is based on guesswork.

Should be Based on Field Work

The closer we get to this picture, the more thoroughly convinced we become that advertising, to be as war-useful as possible, should be based on an up-to-the-minute, first-hand picture of those reader-problems which can, in any way, be solved or alleviated by the advertiser. Good field work today, as in peace-time, helps achieve maximum *economy,* too! (Its cost is less than the ad preparation and the space, yet it can multiply the return on those greater investments many times over.)

Checking among advertisers proved time and again that the ads which the readers tell us they like and which produced the greatest value to the advertiser, were firmly rooted in field research.

Few of the ads in the third Supplement demonstrate any new objectives not previously covered in the main section of the "Guide" or in earlier Supplements. Most of them, however, show what kind of copy results when the advertiser takes the pains to find out what the readers are up against; then develops ads that will help.

In some instances, we are able to report exactly what kind of field work provided the meat of the ads.

"Think-Starters"

May we remind you: This "War Album" is not offered as the *whole* answer to any advertiser's particular problems. It is simply a "think-starter," a collection of ads of the sort which readers like *because they transmit useful information from where it is to where it is needed.*

In studying them you may find the clue to an idea that will help you intensify the usefulness of your own advertising to your customers, to your nation, and to your company. You will automatically receive the third Supplement if you have already requested and received a copy of the "Guide." If you haven't, just check Box No. 3, and mail the coupon.

You might get an idea that would help us improve our Supplements. We'd appreciate any suggestions you care to make.

★ ★ ★

Men who spend most of their time doing field work upon which current advertising is based, have helped us put together a simple check-list of five points which they claim are vitally important to keep in mind if the real problems of your customers are sought. You will find this check-list on Pages 194 and 195 of the third Supplement to the "Guide."

TWO MORE "WAR ALBUMS"

1 AN ADVERTISING MANAGER'S OWN "WAR ALBUM." "We No Longer Need To Advertise . . . If—" It is the best example we've seen so far of a simple way to show company heads, specifically, and by example, exactly why they should authorize advertising expenditures today. This replica of a simple presentation prepared by Richard Hayes, Advertising Manager of the Okonite Company, is a most practical tool in the hands of an advertising man who's faced with the problem of demonstrating why a company should keep on advertising at a time when it has "nothing to sell."

2 SPECIAL REPORT TO CONSUMER-GOODS MANUFACTURERS. "How You Can Help Your Retailers Solve Their War-Time Problems!" We realize that one of the most difficult advertising problems rising out of the war is that of the consumer-goods manufacturer whose ability to supply his retailers has been curtailed or stopped. Yet some have found ways to convert their merchandising paper advertising to war-usefulness just as effectively as they have converted their plants to war production.

This study is a report of recent visits with retailers, and of the methods of advertisers who have found ways to make their advertising helpful to business paper readers at a time when help is so desperately needed. It lists for your convenience a number of war-time problems that retailers told us about. It shows, by example, how successful consumer-goods manufacturers are publishing the kind of helpful information that will unquestionably give them a competitive advantage after the war. It reports, too, what Washington officials like Thurman Arnold and Leon Henderson say about the valid services which advertising can perform today.

FREE

THE ASSOCIATED BUSINESS PAPERS
Room 2797, 369 Lexington Avenue, New York City

Please send me, without obligation, my free copies of the A.B.P. "WAR ALBUMS" checked below.

☐ 1—An Advertising Manager's Own "War Album."
☐ 2—Special Report toConsumer-Goods Manufacturers.
☐ 3—"A Guide to Effective War-Time Advertising."

NAME_____

COMPANY_____

POSITION_____

STREET_____ CITY & STATE_____

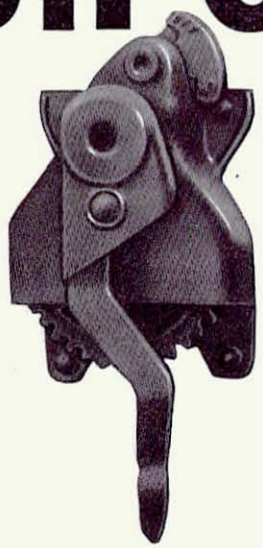
THE ASSOCIATED BUSINESS PAPERS

A national association of business publications devoted to increasing their usefulness to their subscribers and helping advertisers get a bigger return on their investment.

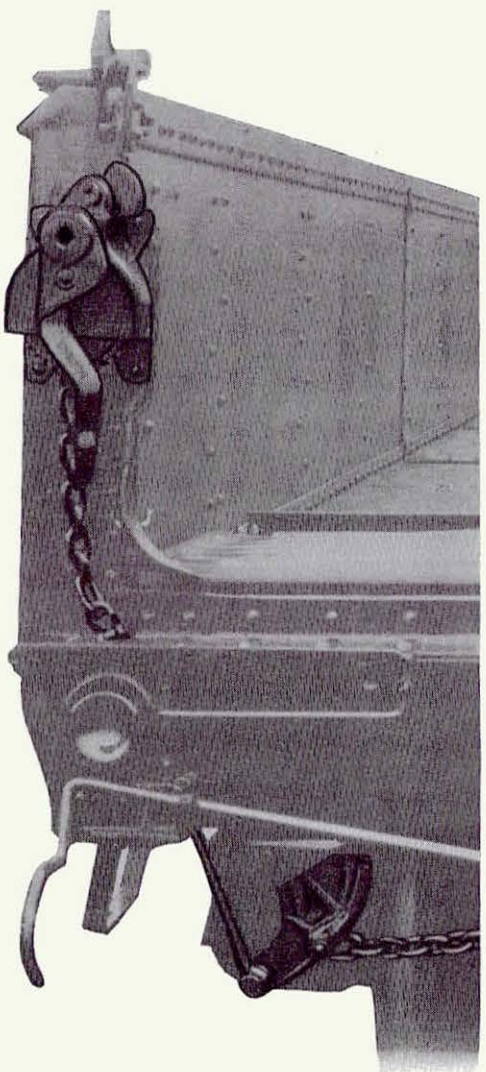
A SAFER, MORE COMPACT HAND BRAKE

EQUIPCO FOR DROP-END GONDOLA CARS

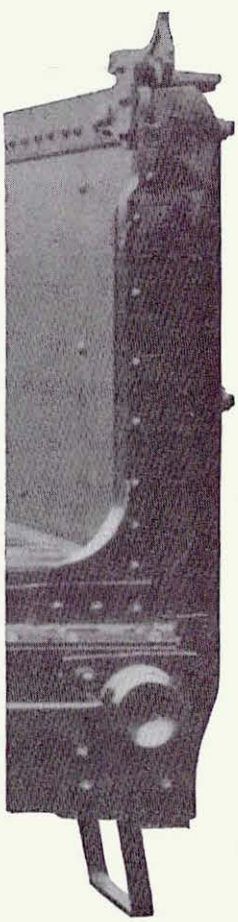
PUMP HANDLE TYPE BRAKE



Safer—because it is installed in such a manner as to permit the trainman a firm, natural footing on the end sill or brake step—no need to hang on for dear life as with brakes operated from side ladder. The Equipco Pump Handle Type Brake permits safer, more efficient operation from within the sides of the car.



Especially designed for economical installation and added safety—requires no special changes in the construction of the car. Powerful, quick-acting—it is adaptable for use under all operating conditions. The Equipco Pump Handle Type Hand Brake provides fast, safe, accurate braking—an essential in the efficient handling of wartime traffic . . .



EQUIPMENT SPECIALTIES DIVISION

UNION ASBESTOS & RUBBER CO.

310 S. MICHIGAN AVE.

CHICAGO

MINER
Friction Draft Gears

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name registered U. S. Patent Office.

Vol. 114 January 2, 1943 No. 1

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PUBLISHED EACH SATURDAY BY THE SIMMONS-BOARDMAN PUBLISHING CORPORATION, 1309 NOBLE STREET, PHILADELPHIA, PA., WITH EDITORIAL AND EXECUTIVE OFFICES AT 30 CHURCH STREET, NEW YORK, N. Y., AND 105 W. ADAMS STREET, CHICAGO, ILL.

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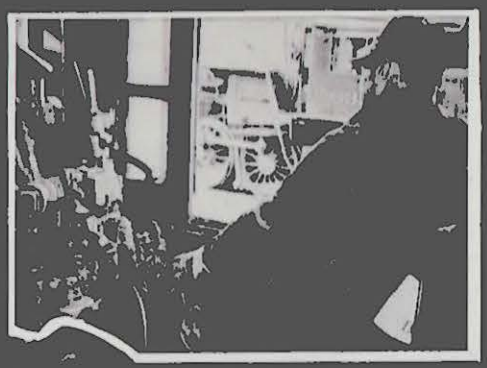

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The Railway Situation in Brief

EARNING POWER: The railroads have made record gross earnings—and net earnings also—in 1942. Larger net has been secured by a phenomenal increase in efficiency—more than counteracting lower charges to patrons, huge increases in wages, and a fantastic rise in taxes. This extremely significant event is discussed in the leading editorial herein. It is further analyzed in an article on page 49. Even more significant, perhaps, than the railway's demonstration of their economic virility is *the failure of this demonstration to restore the confidence of investors*—especially in their equity securities. This aspect of the situation is discussed on page 81. The difficulties of the carriers lie in the political realm—as is evidenced by the fact that the only menace to their present earning power is what the *government may do* (1) regarding wages and (2) regarding rates.

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A WORD FROM MR. EASTMAN: On pages 5 and 6 herein is a message from the Director of ODT, written especially for the *Railway Age* audience. He suggests that a method of dealing successfully with wartime transportation, *much more effective than that of War I*, has been evolved, this time. This modern method is one of *co-operation rather than coercion*—and it is up to those who prefer voluntary methods to exert themselves to the utmost to make the present plan meet all requirements. Mr. Eastman, in particular, believes that plans for meeting manpower shortage should be evolved and installed in advance of dire need.

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SUPPLIES OF MATERIAL: The railroads received $821 millions of materials, fuel excluded, in 1942—compared to 813 millions in 1941, details appearing on page 95 herein. Total materials in stock were 516 millions on December 1, 1942, compared to 437 millions a year before.

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LOCOMOTIVE UTILIZATION: There were only 340 stored freight locomotives in October, 1942, and there were only 2,344 freight engines awaiting repairs. In 1929 the average number of stored freight engines was 2,680 and the number undergoing repairs was 4,477. Also, in October, 1942, freight engines averaged 121 miles daily, as contrasted to 99 miles in 1929. The locomotive situation is painstakingly reviewed in an article (page 12) herein—and it is observed that the record, while obviously worthy of praise, may also indicate how thin the ice is over which it is possible to skate without crashing through.

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FREIGHT CAR SUPPLY: The increase in the average length of haul, and in the ratio of empty to total car-mileage, has increased by 14 hours the average time which elapses between successive loadings per car. These are two of many factors rendering difficult the supply of freight cars under present conditions, which are reviewed by our mechanical editor on page 15 herein. Heavier loading of cars has destroyed the former basis for calculating car demand, but a new method of analysis suggests the following conclusions, namely, a prospective adequate car supply in 1943, *if* there is no intensification of troop movements, *if* the supply of repair materials remains adequate, and *if* car-repair forces are kept intact.

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ROADWAY: Rail applied in 1942 totaled 1.2 million tons—the heaviest since 1930. Ties applied were 49 millions, largest quantity since 1931. These additions, however, are modest—in comparison with the rise in traffic and the scanty work done during the depressed 'Thirties. Meantime, there are also necessary capital outlays in the roadway department—for instance, the new Burlington westbound yard at Galesburg which is saving thousands of car-days and locomotive-hours each month. Recent roadway progress, and needs for the immediate future, are outlined herein on page 18, and construction projects are set forth in detail on page 73.

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TRAFFIC CHANNELS CHANGE: It isn't just the heavier traffic which has magnified the railways' wartime operating problems—but the fact also that business is moving over unusual routes, and a vast tonnage is moving by rail which always heretofore was floated. Originating carriers have had to adapt themselves to the functions of terminating lines—and, then, there has been the vast movement of fuel, and of materials for military posts and munitions plants. The wide variety of transportation changes for which the railways have successfully developed expedients is outlined in significant detail in an article on page 7 herein.

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SIGNALS QUICKEN TRAFFIC: Some of the single-track "bottlenecks" and intensely-used yards would be playing sad tricks on the railroads' contribution to the war program—if it were not for c. t. c., car-retarders and other modern products of the signaling art. On page 28 herein, the contribution of signals to the carriers' effective service to the war program is convincingly summarized. Some of these installations not only boost the traffic along, but they save man-hours and scarce commodities—by doing jobs which alternative methods can perform only by processes costly in both labor and materials.

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COST OF MATERIALS: Coal cost 4½ per cent more in 1942 than in 1941, while fuel oil was up 7½ per cent. Most materials purchased by railroads are under strict "price ceiling" regulation. Nevertheless, as is recorded on page 86 herein, iron and steel was up 4 per cent over last year, while some roads paid as much as 15 per cent more for their lumber acquisitions. Tie prices rose, because the railroads asked for higher prices in order to augment the supply—but still didn't get as many ties as they wanted.

PREPARING FOR POST WAR: For several months, an alert committee of studious railroad officers, under the aegis of the A. A. R., has been surveying the need and opportunity for diverse research—the better to prepare the railroad industry to face the exigencies which the aftermath of the war will bring. An article herein (page 23) reveals the personnel of this important committee, which is headed by one of the railroads' most highly esteemed leaders, Judge R. V. Fletcher. Other planning for the transportation future is being done by governmental agencies—the statutory Board of Investigation & Research and the New Deal group known as the National Resources Planning Board, and their activities are likewise surveyed in the article by our Washington editor.

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IN CANADA: The Dominion's railways in 1942 had their biggest year—as our Ottawa correspondent reports in his article on page 57. Relations between Canada's carriers and allocators of scarce materials are harmonious, because the Minister in charge of munitions was formerly the Minister of Railways; he knows their needs. Dominion railways, besides their transportation contribution to the war program, are also ship operators and builders, munitions manufacturers and—believe it or not—operators of aviation training schools.

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IN MEXICO: Freight ton-kilometers rose 13 per cent in the first ten months of 1942 on the National Railways of Mexico, and other figures indicate a similar greater usage of plant. While relations between the railway management and the unions are harmonious, our correspondent in Mexico reports (page 53 herein) some lack of agreement regarding working rules. A government administration has replaced the ineffective management by employees' representatives.

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EQUIPMENT ORDERS: Complete information on equipment orders is not available this year, because orders by the government (military and lend-lease) are not permitted to be reported. For domestic service, freight car orders totaled 22,307 (see page 111). Locomotive orders for domestic service are tabulated in an article beginning page 117.

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LINE ABANDONMENT: 2,516 miles of line were abandoned in 1942—the largest total in history. The preceding record was 1,995 miles, in 1934. The details of this major effort by the railways, in co-operation with the WPB, to divert materials from little-used railway lines to where they would vigorously further the war program are recorded on page 107.

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DR. PARMELEE'S SURVEY: The customary painstaking summary of the year's railway developments—not only from the statistical standpoint, but also that of the careful archivist—appears herein on page 59, from the pen of the Director of the Bureau of Railway Economics.

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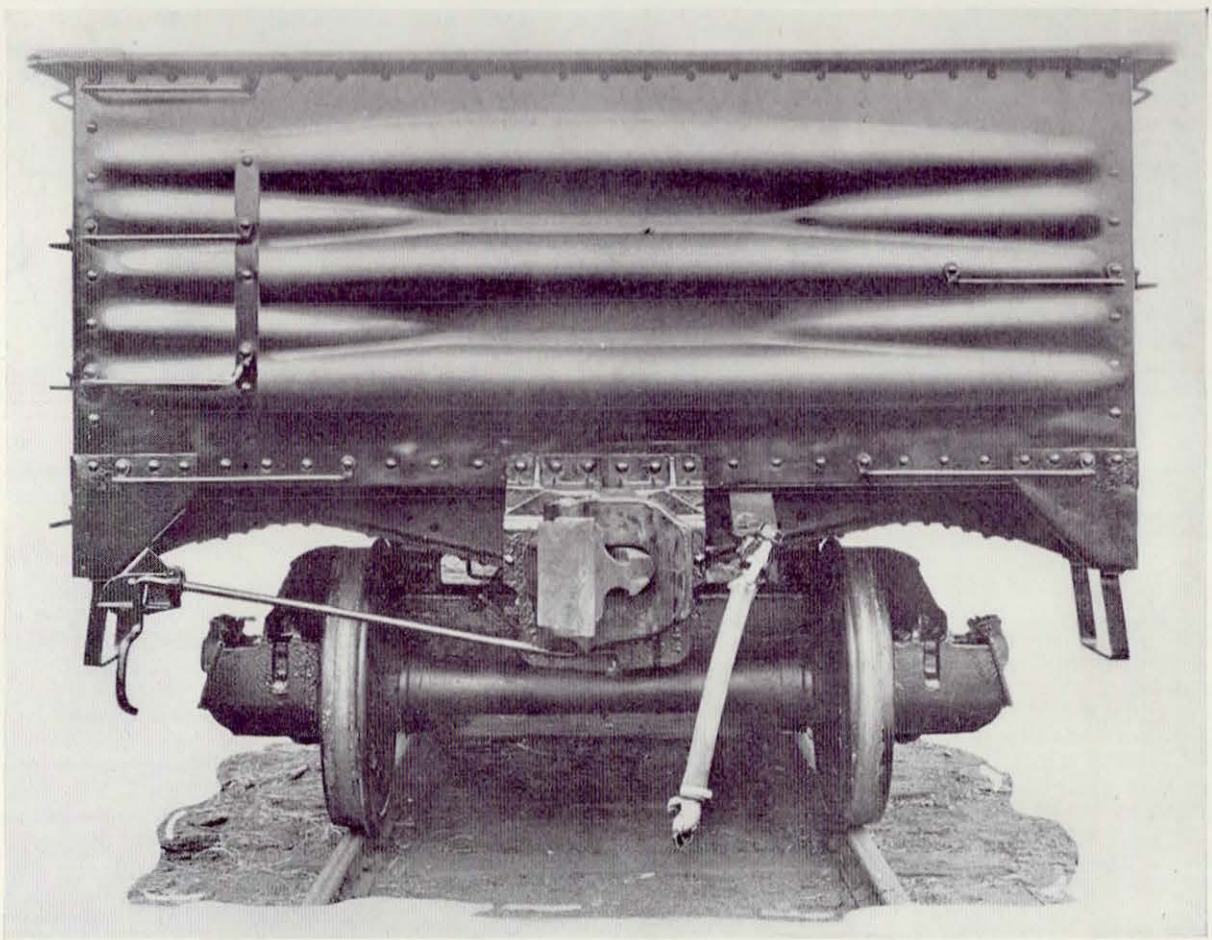

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RAILWAY AGE

Incredible 1942—What of 1943?

The railway record encourages more enthusiasm about what was achieved in 1942 than prophecy about what will be required and accomplished in 1943.

Every estimate made a year ago of the freight service that would be needed and rendered was far exceeded last year. As regards passenger traffic, *Railway Age,* less than a month after Pearl Harbor, merely hazarded that, due to rubber shortage, "the railways may during this war have made upon them a much larger demand for passenger transportation than ever before." So fast was this forecast fulfilled that in May travel by rail exceeded the previous record of 1920, and in the fall attained such volume that railways and the Office of Defense Transportation joined in appealing for a cessation of travel excepting for essential purposes.

Experience in 1942 demonstrated vitally important facts which the national welfare requires shall never be disregarded by public, government, railway managements or railway employees.

Railway Capacity.—It proved a railway capacity, when railways, shippers, government and railway employees co-operate, far exceeding what anybody ever believed to exist. Freight service in 1942 amounting to 640 billion ton-miles exceeded by 35 per cent that of 1941; by 72 per cent that of 1940; by 43 per cent that of 1929; and by 58 per cent that rendered under government operation in 1918. Passenger service amounting to 54 billion passenger-miles exceeded that of 1941 by 86 per cent; that of 1940 by 129 per cent; that of 1929 by 75 per cent; that of the previous record year 1920 by 16 per cent; and that rendered under government operation in 1918 by 28 per cent.

Railway Indispensability.—The national indispensability of adequate railway capacity was demonstrated as never before. For a decade a large part of railway facilities had stood virtually idle; equipment had declined; and managements seeking a return on total investment were criticised for "over-expansion" by labor leaders seeking higher wages and by regulating authorities refusing the return asked. But it would have been utterly impossible for the nation to have so swiftly and enormously increased its production, transoceanic shipping, army, navy and air power if the railway capacity so long unused during depression had been unavailable in the stress of war.

Government versus Private Operation.—Under government operation, railway freight service in the entire year 1918 was increased 3 per cent and passenger service 8 per cent. Under private operation in 1942, freight service was increased 35 per cent and passenger service 86 per cent. And yet there remain persons so allergic to facts that they still criticize railway performance under private operation, condemn the Office of Defense Transportation for not applying more coercion, and advocate government operation in war and government ownership in peace as essential to the national salvation!

Earning Capacity.—Railway gross earnings of probably $7,400 million in 1942 topped 1929's previous high record by $1,100 million—although rates were lower. Operating expenses (including equipment and joint facility rentals) of $4,700 million being only about the same as in 1929,—although wages were much higher and traffic much larger—net earnings from operation of about $2,700 million also topped by about $1,050 million the previous high record of 1929. This figure of $2,700 million somewhat exaggerates the true ability of the railway industry to make net earnings, because, if manpower and materials had been available, operating expenditures for maintenance would have

been larger. When the railways actually have demonstrated such ability to make net earnings, if afforded opportunity, why contend, as do promoters of a socialistic government-planned economy, that the railway industry will have to be taken over and financed by government after the war to contribute its share toward "rebuilding America?"

Purchasing Power.—Railway taxes of about $1,260 million in 1942 were over three times as large as in 1929; *larger than the net operating income earned in any previous year;* and left in 1942 net operating income of about $1,440 million. Out of an increase over 1929 of about $1,100 million in gross earnings, the railways paid an increase of about $900 million in taxes, and got an increase of perhaps $200 million in net railway operating income.

Under normal conditions, purchases of equipment and materials are determined by and somewhat exceed net operating income. This was not the case in 1942, because of government restrictions on equipment and materials. But purchases of approximately $1,100 million were almost as large as in 1941, and exceeded by 90 per cent average annual purchases in 1930 to 1940. And the net operating income earned shows railway purchasing *power* was the greatest in history.

Prospects of 1943.—The record of achievement left by our railways in 1942 has never been surpassed, if equalled, by any other industry. They enter 1943 confronted with government demands for a $500 million annual reduction of rates and labor union demands for an $800 million annual increase of wages; with no prospect of increases in freight equipment proportionate to the prospective increase in freight traffic; and with no prospect of any increase in passenger cars to meet the fastest rising travel demand in history.

The only reason for hoping they can meet the demands of 1943 is the astounding and almost incredible record they made in meeting the demands of 1942.

This is the crucial year of the war. It is the crucial year of wartime railway operation. If the government really desires all efforts concentrated on winning the war, it will let the railways have all the labor, equipment and materials they need and let nobody interfere unnecessarily with their operation or earnings. The record of 1941 and 1942 demonstrates that if the railways fail in 1943, the responsibility will be that of government.

Equipment Supply

New records of intensity of motive power and rolling-stock utilization were established during 1942. The remarkable performance of the limited inventory of freight locomotives is indicated by the fact that they averaged 106.6 miles per locomotive day during October, 1942, compared with the new record of 93.7 miles a year earlier. Freight-car performance was equally notable. Net ton-miles per freight-car day were consistently 20 or more per cent higher than in 1942, and during September exceeded the 1,000 mark for the first time in history.

In the case of neither freight cars nor locomotives is the full significance of the accomplishments of the railroads disclosed by a comparison of the record during the peak month of the year. It must be considered that following the traffic peak of 1941 there was an unusually short breathing spell. Both freight train-miles and freight car-miles passed the highest figures for the preceding year in March and continued upward during the succeeding months. No such sustained demand for high intensity of use has ever before been experienced.

Because of this situation the mechanical-department forces have been faced with new problems. The number of freight cars out of service for repairs is so small that the customary methods of programming heavy repairs have had to be abandoned with a loss of labor efficiency and of control of the demands for materials which systematized repairs made possible. Motive-power officers have been constantly striving to reduce the time in terminals, for servicing and running repairs and to keep to a minimum the time required to complete classified repairs. In this respect the motive power ten years old or under has been a boon in that it will operate from 200,000 miles up between classified repairs. It has also taken far more than its pro rata share of the burden in service.

The most spectacular factor affecting freight-car utilization is the saving of 2½ million loads during the year by the increase in the minimum tonnage of l. c. l. loading established by the ODT in its General Order No. 1. Shippers have also co-operated in effecting heavier loading and in saving car days by prompt loading and unloading. The railways have kept cars moving not only on the road, but through interchanges where opportunities for the loss of time are many. Notwithstanding these factors, the insistent demand for open-top cars has caused a continuously tight situation and the sharp watch on distribution maintained by the Association of American Railroads has been an important factor in the high liquidity of the car supply attained during the past year.

Current estimates anticipate 15 per cent more ton-miles of freight traffic in 1943 than in 1942. This will produce an increase in load on the motive power of a corresponding amount which must be met either by increased train-miles or by increased train load. An increase in locomotive-miles will be reflected directly in increasing demands on shops and engine terminals. The increases in ton-miles will not be accompanied by a corresponding increase in tonnage; the total number of cars loaded during 1943 may not be greatly in excess of 1942. A longer average haul will increase the time which must elapse from one loading to the next.

Present allocations of neither motive power nor

freight cars provide any margin for contingencies such as a shortage of material or a shortage of manpower needed to restore worn-out cars and locomotives to service. For safety, the railways need either (1) allocations for enough new equipment to provide some reserve which present allocations do not include, or (2) assurance of an adequate supply of maintenance material always available when needed and of an adequate supply of men to maintain the present low percentages of bad-order equipment. If both of these requirements are denied, then the battle of transportation will have been lost—in Washington, not on the railways.

Operations

The huge increases in railway traffic in 1942 caused breaking of every operating record except those in which road speed is involved. More of nearly every commodity was hauled farther during the year than ever before, and passenger traffic made almost fantastic gains. The slowing up of freight train schedules was necessitated in many cases by the fact that there were so many trains on the railroads that some of them had to wait on passing tracks for unusually long periods. Many passenger trains simply could not be kept on time because of interference by troop trains and freight trains containing important war traffic. Even with slower schedules, passenger trains are not maintaining anything like the on-time performance of peace time, and it seems inevitable that many schedules will have to be lengthened more if traffic continues to increase.

In respect to freight schedules, a different picture is presented. It is difficult to determine the happy medium of speed that enables maximum utilization of equipment. With cars, and particularly locomotives, at a premium, further study must be given to the determination of how much freight schedules should be changed to attain maximum road capacity and at the same time produce the most effective use of equipment. A locomotive standing on a passing track produces no more transportation than if in the backshop; a standing freight car might just as well be empty. A factor that cannot be overlooked is the psychological effect on shippers, who are being asked to release all cars as promptly as possible, and who wonder why they should incur the trouble and expense of doing so when the railways are slowing many of their schedules.

The railways are faced with another problem that becomes ever more menacing—that of getting enough men. When there is a shortage of 10,000 men on one railroad, the problem is manifestly out of hand. The railways labor unions could be of the greatest assistance in this emergency if they would. There is, perhaps, no labor in the country which, as a whole, is working harder than railway labor. But the total effect is impaired by the transportation brotherhoods clinging tenaciously to their featherbed rules, in spite of the difficulties they impose upon war-time traffic.

One "horrible example" is afforded in California. In that state brakemen must be added if freight trains are increased above 50 cars. As a result, to comply with the law, trains are held at terminals awaiting extra brakemen who are entirely unnecessary.

Communications

On account of the necessity for handling numerous details of railroad operation on a minute-to-minute basis, the year 1942 brought an unprecedented load on the telegraph and telephone communication facilities. Every known practice was employed to utilize existing facilities more intensively and for a greater number of hours each day.

In many instances, Morse telegraph was replaced by printing telegraph service, thus increasing the message capacity of existing line circuits. Telephone train dispatching, to replace Morse telegraph, was installed on 2,153 miles of road, and long-distance telephone service was provided on 9,763 circuit miles. The new line circuits were derived by installing 12,634 miles of new line wire and 18,372 circuit miles of the carrier system, by means of which channels of radio frequencies were superimposed on existing wires so that two, and in some instances as many as four or even more, telegraph messages or telephone conversations can now be accommodated simultaneously on one single line wire circuit.

Even with the facilities added in 1942, the communication systems are unable to meet the requirements; therefore, construction of additional railroad communication facilities should continue at a high level during 1943.

Signaling

Modern signaling gained greater recognition during 1942 as a means of reducing train delays and increasing track capacity than in any previous year. This was evidenced most directly by the action of the War Production Board, in the interest of the war effort, in allocating the materials necessary for carrying out centralized traffic control projects ranging from 20 to 170 miles in length.

As a result, the centralized traffic control installed in 1942 and that scheduled for 1943 will be approximately 1,600 miles, which is about 60 per cent of the total mileage installed prior to 1942. In allocating the critical materials necessary for these projects, the War Production Board recognized that the amounts of materials required were small in comparison with those that would be required for other means of securing the necessary traffic-handling capacity.

Including C. T. C., interlockings and automatic

block, as well as the installation of power switches and car retarders in three freight classification yards, more signaling facilities were placed in service in 1942 than in any year since 1931, if automatically-controlled highway crossing protection be ignored. The materials used in automatic block signaling increased slightly over those employed in 1942, while interlocking construction increased about 10 per cent. By way of contrast, and reflecting the reduction which has occurred in highway traffic, less than half as many protective highway crossing signal units were replaced last year as in 1941.

Engineering

Relatively, 1942 was a big year in both maintenance and construction, affecting nearly every element of the fixed properties, but with greatest emphasis on facilities that affect the safe and expeditious handling of war traffic.

Railway expenditures for maintenance of roadbed and structures rose sharply month by month throughout the year, reaching an estimated $790 million for the year. These expenditures, following expenditures of $603 million in 1941, and exceeding those for similar purposes in any year since 1929, had a vital effect upon the adequacy of the various elements of the fixed properties. But, following depression spending of less than half as much annually, and in the face of a peak war-traffic toll in wear and tear, their effect was largely to maintain or to ameliorate somewhat a subnormal condition, rather than to compensate for earlier losses or to strengthen the properties generally.

Furthermore, because of shortages in labor that reached serious proportions in many parts of the country in the late summer and fall, and shortages of many war-critical materials, maintenance programs during the year were seriously out of balance with specific needs, emphasis, of necessity, being placed often on classes of work that could be done with the forces available, while using a minimum of critical materials, to the neglect of other possibly more pressing kinds of work.

Construction activity, like maintenance, was greater during the year, and, despite shortages of materials and labor, exceeded that of any year since 1931. While new line construction aggregated only 74 miles and second track only 24 miles, other facilities, with the primary purpose of expediting the movement of cars over the line and through terminals, received large attention.

Some of the more important work done included additions to and the rearrangement of yards; the improvement of shop and engine terminal facilities; the addition or improvement of locomotive fuel and water facilities; the construction, extension and relocation of passing sidings; the installation of centralized traffic control; and the application of remote-control switches. While definite figures are not yet available, it is believed that the expenditures for these classes of improvements during the year exceeded $210,000,000, representing an increase of more than 20 per cent over similar expenditures in 1941.

Supplementing these construction activities of the railways themselves, was the extensive track construction program of the Army, the Navy and others for strictly military purposes, including army camps and cantonments, ordnance and munition plants, supply depots, shipbuilding and aircraft plants, arsenals, proving grounds, air fields, etc. At hundreds of different locations, and employing used rail and track fastenings released by the railways, at least 8,000 miles of auxiliary tracks were constructed during 1942, thus bringing about a connection to include these essential war facilities and establishments in the railway network of the country.

Largely to make rail and fastenings available for these essential war facilities, as well as to help fill the imperative need for scrap for war production, the railways during 1942 abandoned 2,516 miles of lines, setting an all-time record and exceeding by 521 miles the previous all-time maximum of 1,995 miles abandoned in 1934.

In addition to these, at the close of the year, the War Production Board was still requisitioning lines which it believed could be abandoned without detriment to the public welfare, and an unusual number of applications for abandonment were pending before the Interstate Commerce Commission—all in the interest of making the materials involved useful in the war effort.

Last year was a big year as regards maintenance and construction expenditures only in comparison with the depression years, and fell far short of the amounts spent for needed improvements and maintenance in earlier years. Also, the expenditures came at a time of a large backlog of curtailed improvements and maintenance work, and in a period of greater changes in practices and more intensive utilization of railway plant than at any other time in the history of the railways.

These facts must not be overlooked—cannot be overlooked safely—in any protracted period of peak demands, and especially when the meeting of those demands is vital to the war effort. No one should be lulled into a false sense of security by the upward trend in expenditures for the maintenance and improvement of the fixed properties in 1942, because, generally, the amounts spent were far from adequate to meet even the current needs of the year. This fact not only augurs, but demands, larger expenditures for both maintenance and construction in 1943, and the materials, equipment and labor necessary to make them possible, if railway fixed properties are not to fall considerably short of the war transportation needs of the country.

Huge Job Done—Harder One Ahead

By Joseph B. Eastman

Director, Office of Defense Transportation

IN the *Railway Age* one year ago, when I was just beginning my duties as Director of the Office of Defense Transportation, I ventured to predict that transportation performance records of 1941, good as they were, would be surpassed in the days ahead, and that this larger job would have to be performed under conditions considerably less favorable than those of 1941. Events of the past year have borne out this forecast.

Looking ahead into 1943, I can make no other prediction than the same one I made a year ago, namely, that the remarkable transportation achievements of the past year must be excelled, and that the job will be performed with increasing difficulty. Performed it will be, however—because it must. Transportation people —whatever means of carriage they use, and among them I include the shippers and receivers of freight—are not a group easily discouraged, even by the most formidable obstacles.

AS an illustration, the railroads and the shippers and receivers of petroleum products, particularly along the North Atlantic seaboard, are now called upon to exact from themselves, individually and co-operatively the very maximum achievement of which ingenuity and effort are capable in organizing this movement to extract from limited facilities the very last ton-mile of petroleum deliveries which they can be forced to produce. Not only the nation's military effectiveness, but maintenance of the minimum tolerable standards of human comfort, largely depend on how well this job is done. The Office of Defense Transportation is co-operating to the best of its ability with the agencies and individuals who have this movement in charge, and I am confident that all concerned will exert themselves to the utmost to overcome, as best we may, a most critical situation.

Railroad men do not need to be reminded that it is difficult to obtain for their industry, under war conditions, an adequate supply of materials, rolling stock and, especially, motive power. The governmental authorities who have in charge the allocation of scarce materials recognize fully, I believe, the need of the nation for continued efficient functioning of the railways. They will do the best they can—among other equally imperative calls on the stocks at their disposal—to allot to the railways as nearly as may be a share commensurate with their requirements. But there is no possibility that such assignments to the railroads will not fall short of what is desirable.

Ingenuity, improvisation, supreme co-operative effort—by the railroads, their employees and their patrons—will have to serve to compensate for the deficit in tools to work with, which will still remain despite the most generous allocation of materials which may reasonably be expected.

THE railroads are already experiencing a shortage of manpower, although not to the same degree in all sections. This, too, will become a problem of increasing seriousness and complexity. There are many expedients which can be adopted to alleviate, although certainly not to overcome, this very serious difficulty. In co-operation with my office the War Manpower Commission will, I believe, adopt reasonable governmental policies toward the transportation industry, insofar as the pressure of other equally important needs for manpower will permit. Nevertheless, an increasingly acute shortage of competent transportation labor is unavoidable. I bespeak for Director Beyer of my Division of Transport Personnel the fullest co-operation of all transportation agencies and their willingness to apply all reasonable available means to meet this situation.

It will be particularly helpful if plans for the use of such expedients can be agreed upon in advance of dire need, because only by careful planning, rather than imperative haste, and by willingness to sacrifice traditional practices where necessary, can unusual measures be introduced without harm to efficient operation. We ought not to hold out against necessary improvisation to the time when the only recourse is sudden resort to innovation on a large scale. Step-by-step progress is the thing to be desired, especially if the transportation machine is to continue to operate smoothly. Both the war effort and civilian economy will suffer, if this is not done.

PASSENGER transportation by railroad continues with us as one of our most perplexing problems. It, too, will grow most difficult. I am hopeful, however, that by persistent appeal to the patriotism of the people we may, at length, induce a large majority voluntarily to forswear for the duration unnecessary travel. This

is the only solution to this problem which is not laden with difficulties which I sincerely hope may be avoided.

WHAT I have said may appear to relate chiefly to the railroads. This is not because of any lack of appreciation of either the accomplishment or the troubles of the other carriers. All of them rate high in both accomplishment and troubles. The difficulties of bus and truck operators are especially acute—embracing as they do not only traffic demands and shortages of materials and manpower like those which afflict the railroads, but being immeasurably intensified by the stringencies in rubber and motor fuel. Barge lines, lake carriers, pipelines and airlines—all are doing an excellent and necessary job, under grave handicaps. And employees of all transportation agencies have shown, in general, an appreciation of their responsibilities to their country at war which is in every way comparable to that evidenced by carrier managements.

The patrons of the transportation industry have shown a degree of co-operation with the carriers which, I believe, is quite without parallel, at least in recent times. They have been especially helpful, in the case of the railroads, in minimizing the detention of cars, in loading cars more heavily, and in making their requests for equipment in such a manner as to permit economy of car utilization. There will be need for continuing and even more effective co-operation of this kind in the coming year.

THE objectives of the Office of Defensive Transportation, in its first year of life, have been primarily the elimination of all waste in transportation and the utmost conservation of facilities consistent with their maximum utilization for necessary purposes. A further objective has been to obtain for the carriers, within the limits which war conditions permit, an adequate supply of materials and new equipment. We have not succeeded in avoiding all mistakes, but I hope they have not been too many. Some few of the orders which we have issued have been criticized, but—in most cases, I think—such criticism as we have had has been more abundant before the order became effective than thereafter. That observation leads me to the belief that the relatively few orders we have issued have, in general, either been wisely conceived at the outset or, if not, that, at least, they have been modified promptly to correct such defects as became evident. In all cases we have tried to enforce them fairly.

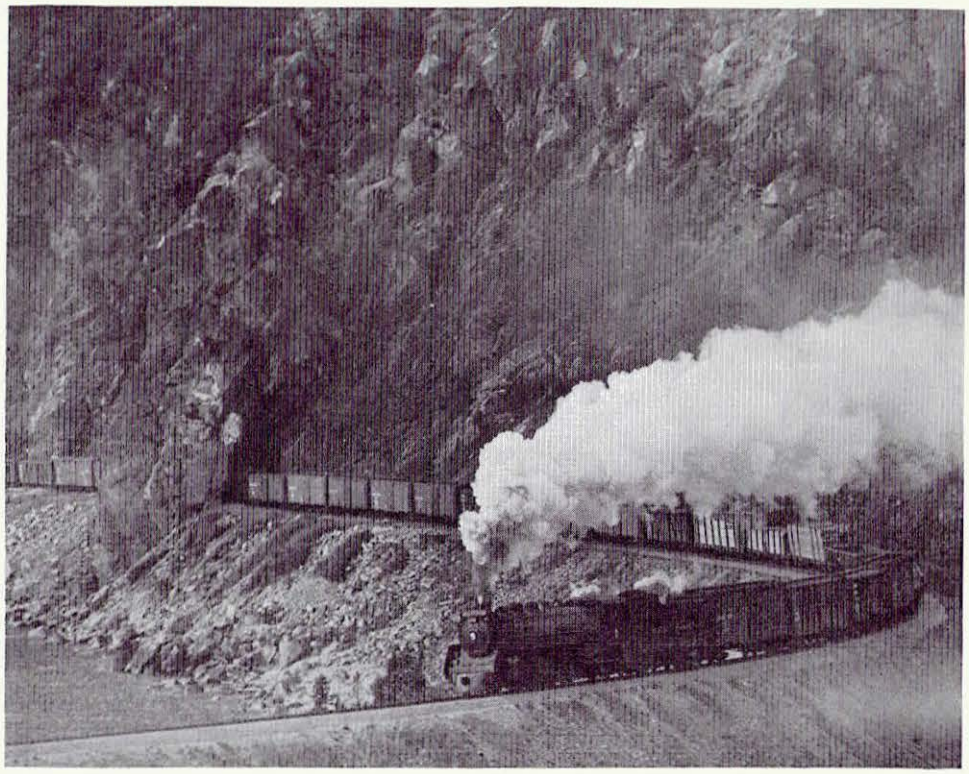
THE method of conducting transportation in this war is widely different from the one which was followed during the last war. May we not fairly compare twelve months of wartime transportation in this conflict with a similar period on the calendar in 1917-18 and conclude that our performance, this time, suggests that our present technique for conducting wartime transportation is a considerable improvement over the one employed in the earlier conflict? Certainly, this time, the transportation agencies are displaying a far more effective degree of co-operation, both among themselves and with their patrons, including the armed forces, than they had achieved at the same stage of the earlier world conflict. And voluntary action by countless thousands of companies, individuals and agencies has, so far at least, made it unnecessary for government, by assumption of direction, control and management, to exert itself to achieve common action to a common purpose, to the degree which was found desirable and necessary in the earlier world war.

If a new and more effective method for procuring singleness of purpose for military victory has been evolved by the transportation industry and the governmental agencies which deal with it, then it devolves upon those in whose hands the ultimate effectiveness of the new arrangement rests, to exert themselves to the full to make the method succeed. Concretely, this means in 1943 the intensification by every individual having to do with the transportation industry, of all the efforts he put forth in 1942 to do his job better. I see no reason to doubt that such effort will be forthcoming, nor can I doubt that it will be necessary, to a degree beyond the experience of any of us.

N. A. M. Resolutions Applicable to Transportation

"The government should not compete directly with private industry and private labor, nor should it subsidize any private producers in competition with other private industry. . . . We are unalterably opposed to the policy of putting the government in competition with private industry; we are opposed to allowing instrumentalities, subdivisions or departments of the government to compete with private industry whether the competition be direct or subsidized."—RESOLUTIONS ADOPTED BY THE NATIONAL ASSOCIATION OF MANUFACTURERS.

War Traffic's Exigencies Are Met



Trans-Continental Traffic Moved Over Western Railroads Is Increasing

Throughout 1942, United States rail transportation agencies met every test and solved every problem

By Charles Layng

Transportation Editor

THE railways handled 630 billion ton-miles of freight traffic in 1942, the largest volume in history. They also handled more than 50 billion passenger miles—again the largest traffic in history. In every respect, the railways met the demands of wartime rail transportation in 1942, despite the fact that these demands included the handling of unprecedented amounts of traffic under difficult conditions. With increasing intensity, the railways were faced throughout the year with drains on their manpower by the military forces and by war production industries, while, at the same time it was difficult to obtain needed rolling stock in most cases and impossible to obtain it in the case of passenger cars. In general, the first full year's operations under current wartime conditions have demonstrated fully the ability of the railways, under private management, to do the "impossible."

In paying justifiable tribute to the railways for their splendid performance, the assistance given by the railway supply manufacturers and by the shippers should not be overlooked. Through constant research, manufacturers have produced cars and locomotives that have stood up under the strain without the necessity of frequent trips to the shop. They have produced tracks and bridges that are withstanding the increased usage by heavier and more frequent trains, and they have produced signals, car retarders and a wide variety of other devices that play important roles in keeping the trains moving safely and without delays.

Co-operation Loads Cars More Heavily

For their part, the shippers have achieved remarkable results in the heavier loading of cars, even before this was made mandatory by O. D. T. order No. 18, and in reducing car detention at loading and unloading facilities.

The work of the vigilance committees under the direction of the shippers' regional advisory boards has been particularly effective in this regard.

Meanwhile, the Office of Defense Transportation has been extremely active in carrying out its primary purpose of seeing that the transportation of the country is conducted in the most effective manner possible. Throughout the year, it has been operated on the theory that it can do many things in the way of improving

transportation that no individual railway is in position to undertake.

Freight Transportation

Co-incident with the increased traffic brought about by the national defense program, the railways began to feel the effects of the curtailment of Panama Canal and Coastwise shipping in 1941. The tonnage hauled in transcontinental movement began a steady climb, which continued to increase in 1942, as the result of the closing of the Panama Canal to commercial shipping. The extent of this cannot be realized unless consideration is given to the fact that certain varieties of traffic moved by boat through the canal from and to points as far as 400 miles inland from both coasts. The extent to which lumber was shipped by boat is indicated by the fact that in the last 20 years, 90 per cent of the lumber mills in the Pacific Coast territory have moved from inland points to ports along the coast and, in some areas, there are no longer any inland mills operating.

Another factor that vitally affected the transcontinental lines was the vast new industrial development along the coast and the location of large military and naval establishments there. All of these lines had long been classed as originating carriers, since the large percentage of the tonnage they handled was eastbound, in the form of food products and raw materials. Almost overnight, these railways became delivering carriers on a hitherto unheard-of scale, with new operating problems.

Change in the Minerals Situation

Meanwhile, the mines in the West began a large expansion. Mines producing metals on the critical materials list are largely located in the inter-mountain territory and, while their production and the amount of tonnage of such ore handled by the railways is classed as a military secret, it may be said that this increased production presented still further problems for the transcontinental lines. The mining and shipping of coal to Pacific Coast points has also undergone radical changes. Until recently, the mines in the Pacific Northwest, for example, were able to produce enough for local supply. Two factors have tended to change this. One is that there is at present a shortage of miners in this area because of these men leaving for service in the armed forces or in war production industries and the other is that, with the increased industrialization of the area, the consumption of coal has been largely increased. Accordingly, it is now necessary to ship coal from Colorado and Utah mines and, beginning this fall, the supply is being augmented by "lake" coal shipped from Duluth to the Pacific Northwest in box cars, most of which would otherwise move west empty. In addition, there are many other new movements of ore that never took place before. Bauxite ore, for example, is moving west in trainloads.

Dislocation of Traffic Channels

If it was simply a question of handling more traffic in the regular channels in which such tonnage normally moves, the operating problems would be relatively simple. However, all, over the country and in the West particularly, normal traffic channels have been disrupted and a completely new set of operating problems is offered for solution. The movement of perishables supplies an example of this. Ordinarily, perishables from the West Coast move in a routine fashion from the growing areas to eastern markets. Through long experience, the matter of car supply and other operating details had become routine matters, with only occasional cars requiring special attention. On the contrary, the location of large military camps, all consuming quantities of perishables, at various points which were not previously in the regular channels of movement of perishables, has dislocated the even flow of the return of empty refrigerator cars and created a new set of problems.

Handling the Nation's Oil

In addition to transcontinental traffic, the movement of petroleum and products has also undergone a complete change because of the shipping situation. The railways were handling only a relatively small quantity of this tonnage previously, the large percentage of it moving by pipe line from the producing fields to the refineries and again by pipe line to the ports for further movement by tanker. In April, 1941, 50 American tankers were turned over to the British and the trend

The Use of Diesel-Electric Locomotives for Freight Service Aided the Power Situation

A Record Movement of More Than 90,000,000 Tons of Ore Kept the Wheels of Industry Humming

toward all-rail movement began. At that time, grave doubts were expressed as to whether the railways could handle the movement and various agencies made estimates that have since been proved far too conservative.

Once the problem was understood, a flow of loaded tank cars began moving East on high-speed schedules and the empties were returned with equal celerity. The estimated top load of 300,000 barrels daily was soon equalled and passed. Then, on August 1, 1942, 78 schedules over definite routes were set up under a block system of operation and, during the week ending August 8, the effectiveness of this system was proved when an average of 809,430 barrels a day was handled. This was the first week during which a daily average over 800,000 barrels was transported, but by no means the last, for this figure has been reached and exceeded consistently since then. The brunt of this movement, of course, fell upon the originating lines in the South and Southwest and, in general, they have the longest haul. Credit is also due, however, to the terminal railways which have broken all records for speed of handling the oil through terminals (in trainload lots as far as possible) and to the eastern lines, which have set up high-speed schedules to delivering points and are charged with the responsibility of getting empties back speedily.

Other Diversions from Ships to Rails

The movement of sulphur from the Texas mines has also become largely all-rail. As many as three trainloads a day are frequently shipped from the producing areas in both box and open-top cars. In addition, much of the general freight that formerly moved via boat between Gulf ports and the eastern seaboard is now diverted to all-rail movement. A further factor is that traffic from and to South and Central American points that formerly moved direct to the eastern seaboard by boat is now being trans-shipped to the railways at the Gulf ports for all-rail movement to the East. During the construction period the problems of the railways in the producing territories were enhanced by the largely increased movement of lumber.

The diversion of coastwise ships to other purposes has resulted in a large increase in the amount of perishables handled all-rail from Florida to eastern destinations. A growing percentage of this traffic formerly moved by truck to the Florida ports and then in refrigerated ships to the north Atlantic ports. In addition, much general traffic between Florida and the North has also been diverted to all-rail movement for the same reason.

Thus the railways of both the Southeast and Southwest have encountered many special problems and these have been complicated further by reason of the fact that, because of favorable climatic conditions, a large percentage of the country's military establishments are situated in those areas. These produce a large amount of inbound and outbound traffic. During the construction period it is not unusual for an individual camp to receive as many as 150 to 200 cars daily and the larger camps require special switching and other service, mostly at small towns where the demand for rail transportation was previously light.

No Wheat Transportation Problem in 1942

The railways of the Middle West were called upon to face their share of all these problems as part of the national transportation system. In addition, they were called upon to solve many other problems peculiar to their territory. One of their major problems, the wheat movement, which ordinarily recurs annually, offered no difficulties this year. Until the harvesting season of 1941, the handling of this crop meant securing the full co-operation of the eastern lines in returning western-owned box cars promptly prior to the opening of the season, so that supplies of such empties could be distributed strategically throughout the growing area before the wheat began to move. This practice was followed for some years under the auspices of the Car Service division of the A. A. R. Last year, however, it was evident that the lack of storage space brought about by the curtailment of foreign markets and the government's "ever-normal granary" plan would interfere with the movement. Even so, as a matter of insurance, the railways had cars ready to move the crop as usual. This precaution proved to be largely unnecessary because sufficient storage space could not be found.

In 1942, however, it was evident months ahead of time that the shortage situation was such that there could not possibly be a wheat "rush" and, for the first time in many years, there was no concentration of empties in the growing area. The wheat that was shipped was handled under the permit system; in other words, no cars were supplied unless the shipper could show that he had space allocated to him in an elevator at destination. There was so little space available that the move-

ment was reduced to a point where no special preparations were necessary and all the wheat that moved could be handled under regular operations. This, of course, prevented tieing up many thousands of box cars that could better be used for service in handling other freight.

The ore movement from Minnesota and upper Michigan to the lakes for transshipment to boats, as well as the companion rail movement from Lake Erie ports to the Pittsburgh district, was handled by the railways with their customary efficiency, despite the fact that the demands upon them for this type of transportation were an all-record high this year. This movement amounted to 92,000,000 tons and compares with 80,000,000 tons handled in 1941, which figure was 15,000,000 tons greater than for any previous season.

A further factor that complicated the problems of the railways in the central section of the country is the number of ordnance and other governmental war production plants situated in this heavily industrialized area. Some of these plants are of such extent as to include more than 100 miles of industry tracks within the properties. The railways have not only given such plants the necessary transportation but they have also assigned their engineers to assist in the planning and construction and their purchasing agents to assist in buying materials. Many of these plants are situated at outlying points, which have required a revision of operations so that they may be served properly.

Coal for New England

The eastern railways have, of course, participated in the transcontinental hauls; in the increase in coastwise traffic; and in the tremendously enlarged industrial activities in the more heavily settled sections of the country which they serve. They have also been called upon to handle several specialized movements, such as, for example, coal for New England destinations which formerly moved to ports, largely to Norfolk, Va., and was forwarded to New England ports by colliers. This, too, has now become an all-rail movement, but, through making arrangements somewhat similar to those in effect on the oil movement, the railways have been able to absorb the additional coal traffic along with other increased traffic. In general, the coal is handled in trainload lots and intermediate yarding is avoided as much as possible. For example, many trainloads of coal pass through busy Potomac Yards at Alexandria, Va., without going over the hump.

As the nation becomes more and more geared to the economy of an all-out war, mass transportation takes on greater importance accordingly. Our war plants are not producing in job lots, they are manufacturing materials by the carload, by the trainload and the supply of raw materials moves in the same quantities. Less-than-carload traffic is always made up largely of consumer goods and the curtailment of many items for civilian use has had its effect on this traffic. Also, the services has been affected in many instances because of the effects of ODT order No. 1, prohibiting the shipment of lightly loaded merchandise cars.

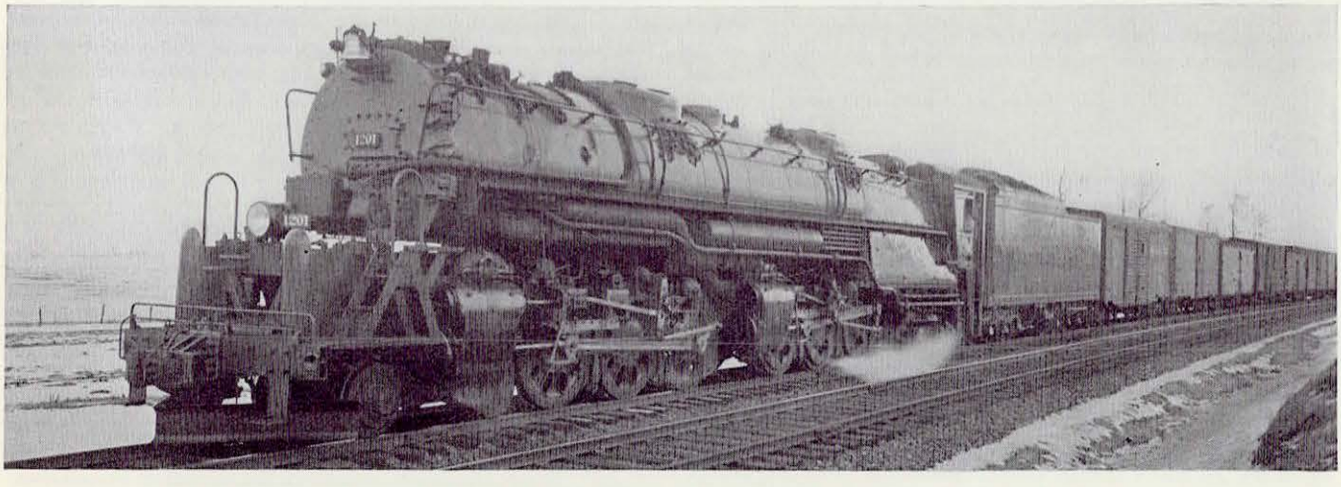
L. C. L. Traffic Less Important Now

It is difficult to allocate the exact effect of the adjustment from civilian to wartime economy on the total tonnage of L.C.L. freight handled. The carloadings of such freight have shown a continuing decline in an era of sharply rising traffic. The effect of ODT order No. 1 in saving cars is clearly indicated by a survey of the trend taken by the carloadings of merchandise.

On November 14, the ODT approved the first L.C.L. pool to be put into effect by any of the country's railways. The arrangement was entered into between Memphis and Jacksonville and provides that the St. Louis-San Francisco load and forward a car six days a week from Memphis to Jacksonville and this car will be alternated daily between the St. L.-S. F.-C. of Ga.-S. A. L. route and the St. L.-S. F.-C. of Ga.-A. C. L. route. The Frisco is authorized to disregard routing instructions. In giving its permission, the ODT stated that this "should point the way for other railroads whose lines operate between the same terminals and who have been unable to meet the minimum load requirement under individual operation, to seek similar pooling authority."

No Congestion at Ports

The North Atlantic ports were the bottlenecks in 1917-18, but that is not the case today. When the national defense program began, the Association of American Railroads, through its Car Service division, set up an organization through its manager of port traffic, to co-operate with ocean shipping, stevedoring and other agencies having to do with the trans-shipment of freight from rail to ships, not only at the North Atlantic ports but also at all the other ports in the country, since, in this global war, all American ports have assumed great importance. There has been complete co-operation



Huge New Locomotives Helped to Prevent an Acute Shortage of Motive Power

among all concerned, with the result that, although occasional "tight" situations have developed, there has been no repetition of the scenes of 1917-18, when thousands of cars standing under load clogged the ports and the railway yards of the East in general.

Railway cars are not now used for storage of traffic awaiting ships. Not only are the ports more fluid and handling far greater daily average tonnage for actual overseas shipment, but an arrangement of unloading depots has been worked out in the vicinity of each port, at which freight for which no ships are immediately available is unloaded and the freight cars thus made empty are immediately restored to active service. The depots are equipped with trackage planned by railway engineers to facilitate the loading and unloading of freight in the most efficient possible manner.

Service on Military Freight

The Car Service division of the A. A. R. has also set up a bureau of military traffic. The manager of this bureau makes his headquarters in the Army building and, as it has actually worked out, co-operates so closely with the Transportation Corps of the Army as to be, in effect, a part of that corps. In return, the officers of the corps make every effort to give him as much advance notice as possible of forthcoming freight movements, so that the proper equipment may be made available by the railways involved in the movement and they, in turn, may have as much advance notice as possible of what they will be expected to do. It is, unfortunately, not always possible to give such advance notice, but each day shows improvement in this respect and the purely military freight is now being handled with a minimum of lost time and waste motion. As rapidly as possible, the system for handling such freight was worked out and, as experience teaches better methods, they are being adopted with a minimum of delay and red tape.

Passenger Service in High Gear

The demands upon the railways for passenger service are relatively greater than those for freight service. A complete resume of the situation in this regard was given in the Passenger Service Efficiency Number of the *Railway Age* of November 21, 1942, and the activities of 1942 will be summarized only briefly here. However, the handling of approximately 11,000,000 troops in group movement in 1942 and the piling up of over 50 billion passenger-miles in the same period indicate the gigantic task the railways performed during the last twelve months. If such astronomic figures had been mentioned even as recently as two years ago, the most qualified observers would have expressed grave doubts as to the ability of the railways to perform this hitherto unheard-of service. It was accomplished, however, and, on the whole, this vast multitude of railway customers was transported without undue hardship, considering the emergency conditions existing. This was done with existing passenger equipment far less than was on hand in 1920, the previous record year of passenger traffic.

How it was done may be explained by reference to the better, if less numerous, passenger cars and locomotives in service today. Such equipment spends far less time in the shops today than it did in 1920, and when it is shopped, repairs are completed and the equipment returned to service far faster than ever before. The distribution and assignment of equipment are also improved so much that far greater utilization of each unit is obtained. The contribution of the railways to the war effort in the moving of troop trains was described in detail in the issue above referred to. Here again, as in the freight movement, co-operation between the military authorities and the railways has made the task far easier than it would have been otherwise.

Passenger Traffic Control

Rationing of passenger travel, which was looked upon with considerable favor in some circles earlier in the year, is now generally considered to be inadvisable and uneconomic on any nation-wide basis. The revolutionary step of railways discouraging certain types of travel in their advertising is having its effect and pleasure travel is being reduced automatically as travel becomes necessarily less pleasurable.

So far as the effects of nation-wide gas rationing may be judged from the few weeks available as evidence, the effect on rail transportation is less than might have been anticipated. In the final analysis, there was comparatively little long-distance automobile travel that could be classed as essential travel under the war-time meaning of the term. The joy-riders and the vacationers who made up the sizable percentage of long-distance travel in private automobiles, are simply staying at home. The effect on local travel seems to be more marked but not overwhelmingly so. After all, people engaged in strictly essential travel can still get all the gasoline they need to make short trips. A factor that has not perhaps been given sufficient attention in this regard is that many of the former long-distance automobile travelers are now far too busy in war production work to spare the time for extended vacation trips.

Other Railway Wartime Activities

Besides supplying vitally essential war-time transportation, the railways have also contributed to the war effort in many other ways. They have gone to great pains to replace men not considered to be vitally essential so that the demands of selective service may be met. In addition to supplying the armed forces with many thousands of ordinary soldiers, sailors and marines, they have also contributed freely of their technically trained specialists. More thousands of these have gone to supply the officer and other technical personnel ranks of a wide variety of services. The demands of railway service are so diversified that they had specialists available for almost every branch of the Army and Navy.

Supplementing all of this, the railways have contributed the entire personnel of the Military Railway Service of the Transportation Corps. Many railways have supplied whole battalions of their men, representing a complete cross-section of railway service, to the M. R. S., and many of these are now serving overseas, with more battalions ready to be dispatched as soon as the occasion arises.

Almost all other industries, save perhaps the munitions industry, had to be converted into war-time agencies. As an integral part of the nation's economic set-up; and being accustomed to being called upon in peacetime as well as during wars for unusual public service, the railways were a "weapon" ready-forged and set for action in that all-important field in wartime—mass transportation of personnel and materials.

No tremendous, basic changes were necessary to gear them to the war effort. In fact, they have so far managed to get along with far less equipment than is really necessary to do the job properly, by the exercise of ingenuity and technical skill. The possibilities along these lines have already been exceeded far more than the most ardent optimist could possibly expect.

Will 1943 Motive Power Come From Builder or Back Shop?

Record-breaking tonnage of 1942, in spite of lower car loadings at traffic peak, required highest locomotive utilization in history of railroading

By H. C. Wilcox

Associate Editor

IN an article discussing the question of motive power capacity in the Annual Statistical number of this publication one year ago, the statement was made that "For 10 years the railroads of this country have been waiting for a sufficient volume of traffic to create an opportunity to apply the service test to the type of operation that had, of necessity, to be developed during the depression and in the face of increasingly stiff competition. During 1940 we thought that the test had been successfully completed but it remained for 1941 to produce the operating trial to show what our railroad plant and organization is really made of. As we look ahead to 1942 and 1943 it is with confidence borne of the knowledge that if an intelligent equipment program is carried out the primary transportation facility of this country can function as it never has before."

The manner in which the equipment program of 1942 was carried out is now a matter of history. One year ago it was estimated that in order to have a safe and reasonable margin of motive power capacity a total of 1,000 locomotives would need to be added to an inventory in which almost 70 per cent of the units are over 20 years old. As far as freight motive power is concerned, 466 units—340 steam, 121 Diesel and 5 electric—were ordered by railroads during the year 1942. Of especial significance is the fact that as of this date less than half of these locomotives have been authorized by WPB for delivery. Some idea of the extent to which the limited addition of new motive power was able to contribute to the handling of the traffic peaks of 1942 may be seen in the fact that in October, 1942, the total freight locomotive inventory was only 197 units greater than it was in October, 1941. To this extent, and only to this extent, were the railroads able to carry out what was then considered a "must" program for the acquisition of such locomotives as were needed. When the record of railroad performance for the year ending October 31, 1942, is reviewed there will probably be at least three types of reaction to what has taken place, depending upon the interests of the groups or individuals involved.

There will be those who will hasten to assure us that the railroads did not actually need any more locomotives than they had; all they needed was to learn how to use *what* they had. There will be few motive power or operating men in this class; in fact, not many railroad men.

Table I—Freight Locomotive Utilization During October Traffic Peaks

	Total freight locos. 1	Un-service-able 2	Stored service-able 3	Active 4	Active locos., per cent total locos. 5	Aggregate tractive force (000) 6	Loco. miles (000) 7	G.t.m. (excl. loco. and tender) (000,000) 8	Freight-train miles (000) 9	Loco. miles per active loco. 10	Loco. miles per total loco. 11	Loco. miles per freight train mile 12	G.t.m. per 1,000 lb. trac-tive force (000) 13	G.t.m. per train mile 14
1923	33,203	5,947	1,865	25,391	76.5	1,793,785	65,973	92,640	58,492	2,600	1,990	1.13	51.6	1,584
1924	33,359	6,079	3,219	24,061	72.5	1,832,216	62,910	94,730	55,952	2,610	1,880	1.12	51.6	1,693
1925	32,390	5,423	3,055	23,812	73.5	1,827,207	65,568	100,026	58,512	2,760	2,020	1.12	54.7	1,709
1926	31,543	4,782	2,699	24,062	76.5	1,842,369	66,031	107,238	58,798	2,740	2,100	1.12	58.3	1,824
1927	30,960	4,626	3,418	22,916	74.0	1,815,903	64,231	105,797	56,582	2,800	2,070	1.13	58.5	1,870
1928	30,062	4,764	2,971	22,327	74.2	1,796,379	65,165	110,276	57,211	2,920	2,160	1.14	61.2	1,928
1929	28,912	4,477	2,680	21,755	75.5	1,768,968	64,756	110,444	56,748	2,970	2,240	1.14	62.2	1,946
1930	28,738	5,123	4,940	18,675	65.3	1,775,435	54,665	94,931	46,313	2,920	1,910	1.18	53.3	1,965
1931	28,667	6,071	6,225	16,371	57.3	1,755,779	44,903	75,403	40,250	2,740	1,560	1.11	42.8	1,873
1932	27,310	7,891	5,801	13,618	50.0	1,719,166	40,372	66,143	36,344	2,970	1,480	1.11	38.4	1,820
1933	26,925	8,985	3,787	14,153	52.8	1,672,763	40,589	65,812	36,476	2,860	1,510	1.11	39.4	1,804
1934	25,964	8,707	3,402	13,855	53.7	1,597,000	41,205	66,311	37,159	2,960	1,585	1.11	41.3	1,785
1935	25,144	8,414	2,213	14,517	57.9	1,572,950	45,151	75,671	36,858	3,120	1.800	1.22	48.2	1,895
1936	24,498	6,813	1,642	16,043	62.9	1,571,487	50,742	86,987	44,333	3,170	2,070	1.14	55.3	1,948
1937*	23,889	5,914	1,673	16,302	68.4	1,558,838	50,117	88,245	44,572	3,070	2,100	1.12	56.5	1,998
1938*	23,729	7,300	1,785	14,665	61.9	1,566,246	44,622	79,951	39,615	3,040	1,880	1.12	51.1	2,036
1939*	22,909	6,425	832	15,652	68.4	1,550,988	49,945	93,209	44,034	3,190	2,180	1.13	60.0	2,137
1940*	22,186	5,253	1,352	15,581	70.4	1,517,597	49,983	92,946	44,272	3,200	2,249	1.12	61.4	2,120
1941*	21,830	3,528	841	17,461	79.5	1,499,817	61,501	116,340	53,866	3,522	2,812	1.14	77.6	2,183
1942*	22,027	2,344	340	19,343	87.8	1,532,031	70,461	141,880	60,717	3,642	3,198	1.16	92.6	2,365

* Data from I. C. C. Bureau of Statistics, Freight Service Operating Statistics of Class I Steam Railways in the United States (Statement No. M-210, to and including 1935); Freight Train Performance of Class I Steam Railways in the United States (Statement No. M-211 OS-A, 1936 to date); and Motive Power and Car Equipment of Class I Steam Railways in the United States (Statement No. M-240 OS-F). Aggregate tractive force based on A. A. R. Car Service Division Form CS-56A-1.

Then, there will be the railroad man of the "Well, we got away with that one!" type whose satisfaction with the accomplishment of the seemingly impossible distorts judgment to the extent of gambling with the law of averages and expecting always to be on the winning side. Napoleon operated on somewhat the same basis and, we hope, Hitler is following in Bonaparte's footsteps.

Finally, there will be the railroad man who knows by what a narrow margin the railroad battle of 1942 was won and who, representing though he does a minority, of this record assumes important proportions when compared, for example, with the month of October, 1929. In October, 1929, there were 6,885 more freight locomotives than in 1942 and of the then total 75.5 per cent, or 21,755, were used to handle the October traffic of 110.4 billion gross ton-miles and 56.7 million train-miles. This required a daily average of 99 locomotive-miles (2,970 a month).

How much more secure against emergencies the operating or mechanical man was in 1929 can be seen in the

Table II—Freight Locomotive Utilization for Twelve-Month Period

	Total freight locos. 1	Un-service-able 2	Stored service-able 3	Active 4	Active locos., per cent total locos. 5	Aggregate tractive force (000) 6	Loco. miles (000) 7	G.t.m. (excl. loco. and tender) (000,000) 8	Freight-train miles (000) 9	Loco. miles per active loco. 10	Loco. miles per total locos. 11	Loco. miles per freight train mile 12	G.t.m. per 1,000 lb. trac-tive force (000) 13	G.t.m. per train mile 14
1941														
November	21,774	4,350	1,049	16,375	75.2	1,500,393	56,893	106,241	49,924	3,474	2,613	1.14	70.8	2,151
December	21,776	3,406	1,071	17,299	79.8	1,501,223	57,323	102,957	50,231	3,256	2,632	1.14	68.6	2,073
1942														
January	21,888	3,253	926	17,709	81.0	1,503,056	59,461	106,532	51,930	3,358	2,717	1.15	70.8	2,075
February	21,841	3,238	916	16,687	81.0	1,503,449	55,030	100,489	38,031	3,111	2,520	1.15	66.8	2,115
March	21,920	3,141	740	18,039	82.3	1,505,308	62,087	117,851	53,124	3,442	2,832	1.15	78.2	2,200
April	21,915	3,119	688	18,108	82.6	1,506,402	62,128	120,725	53,921	3,431	2,835	1.15	80.2	2,264
May	21,963	2,995	612	18,356	83.6	1,507,934	65,385	130,070	56,558	3,562	2,977	1.16	86.2	2,325
June	21,927	2,888	549	18,490	84.3	1,513,015	63,292	125,959	54,711	3,423	2,887	1.16	83.3	2,328
July	21,923	2,744	527	18,652	85.7	1,513,670	66,197	132,089	57,193	3,548	3,020	1.16	87.1	2,336
August	22,028	2,844	475	18,709	85.0	1,515,741	67,389	135,972	58,136	3,602	3,059	1.16	89.8	2,366
September	22,075	2,705	367	19,003	86.1	1,518,757	66,716	134,166	57,625	3,511	3,022	1.16	88.3	2,356
October	22,027	2,344	340	19,343	87.8	1,532,031	70,461	141,880	60,717	3,642	3,198	1.16	92.6	2,365

Statistical data from same source as that in Table I.

resolves to fight for the things the railroads need to do their part in the successful conclusion of this war. Fortunately, events of the past few days indicate that this type of railroad men is about to get a fair hearing.

Just what did the railroads accomplish in the matter of motive power utilization in that 12-month period? The statistics in the two accompanying tables tell the story of a history-making achievement far better than words, and to those who are familiar with the handling of freight traffic by the railroads the same statistics point to some danger signs with respect to motive power that can not well be ignored.

By selection of data from Table I for October, 1942, we find that 19,343 freight locomotives, averaging 69,550 lb. tractive force ran an average of 121.4 miles per day (3,642 per month) in the handling of 60.7 million train-miles and 141.8 billion gross ton-miles. The measure fact that there were 2,340 *more* locomotives stored in serviceable condition than in 1942; in fact, in October, 1942, there were just 340 (1.5 per cent of the freight inventory)—an all-time low. Those in unserviceable condition (in or awaiting shop) in 1929 totaled 4,477 as compared with 2,344 in October, 1942. That 87.8 per cent of active locomotives in service may represent only an accomplishment to be proud of to some railroad men, but to many others it is an example of how close to the limit of locomotive capacity it is possible to come without actually experiencing a serious shortage of power.

In normal times motive power shortages in October peaks might merely mean that a civilian consumer would be temporarily inconvenienced by a delay in the shipment of "goods of convenience." In wartimes, such as these, a shortage of power can easily mean the loss of

battles and thousands of American lives. Then, too, in peacetime every railroad man knows that if he can get through October there comes the breathing spell of declining traffic volume in which run-out locomotive mileage can be restored. After the traffic peak of October, 1941, there was no breathing spell. It is true that traffic volume declined slightly, for two months, and then, with due allowance for the cold winter weather of January and February when tonnage ratings must, of necessity, be reduced, the pressure went on again. In order that this condition may be properly impressed upon the minds of those interested in motive power, Table II is included in this article.

Beginning in March, 1942, there was not a single month in which a new record in locomotive utilization was not established—not a single month in which the performances of both October, 1929, and October, 1941, were not exceeded. More than this was the fact that, in order to meet traffic demands, serviceable locomotives were withdrawn from storage and the shops were called upon to restore locomotives to service in decreasing periods of time. Some indication of the man-power problem may be observed in the fact that boilermakers' and machinists' man-hours in 1942 exceeded 1941 by 21 per cent.

As matters stand at this moment it is useless to talk about the possible traffic peaks of 1943. If the experiences of 1942 are any guide it is quite possible that at least eight of the next twelve months will bring a traffic peak, on a ton-mile basis, of heretofore unheard of proportions. In the past 12 months the roads experienced an increase of 8.3 per cent in active freight locomotives (Col. 5 of Table I); as well as an increase in monthly freight locomotive mileage from 3,522 to 3,642 (Col. 10 of Table I). Has anyone the courage to suggest just how much farther the motive power capacity limit can be stretched?

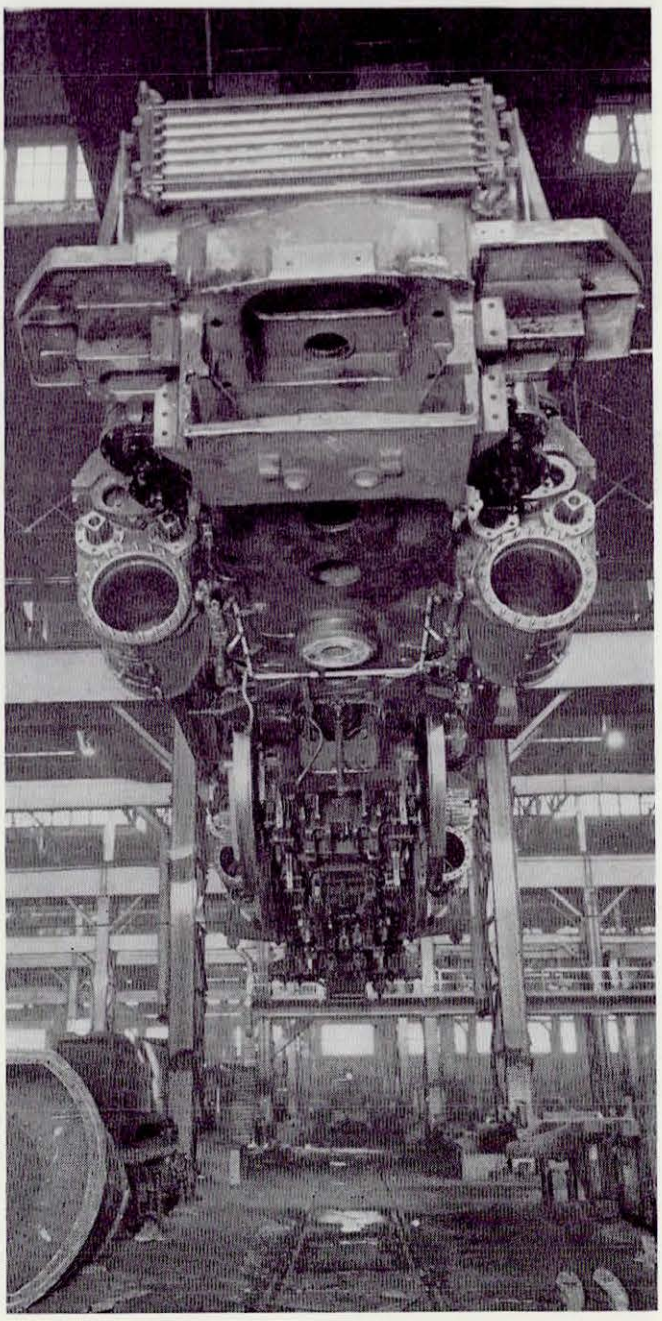
Will the Shop Be the Bottleneck?

The problem of 1943 will be to maintain the pace that has been set during the past year. The statistics of motive power performance indicate that the roads have gone deeper and deeper into reserve capacity in order to do the job that has been done. The 340 stored serviceable locomotives represented the October reserve. What kind of locomotives are they? If, for example, they are in storage because they are the least efficient, it is probable that they represent an average tractive force of not over 55,000 lb. Such being the case, and at current averages, these 340 units would be capable of handling just about .005 per cent of the traffic that was actually handled in October, 1942. That is a picture of reserve capacity.

After having finished eight-months' operation at steadily mounting traffic peaks what is the condition of our motive power? There are no statistics readily available that will answer this question but railroad men who are close to the situation will probably confirm the fact that the relatively small proportion of locomotives five, ten and fifteen years of age are, on many roads hauling from 50 to 60 per cent of the traffic. The operating departments are probably demanding the last serviceable mile out of all active power before releasing it to the shops for overhauling. The condition of locomotives under such circumstances is one in which heavy maintenance is cumulative and the point is finally reached where an increasing number of units must go to the shop for rebuilding or general overhauling.

Where are the railroads going to get the locomotive capacity needed for 1943's business? There are three ways in which it can be secured: (1) By the acquisition of new power, (2) by further increases in utilization, and (3) by the more rapid restoration of run-out mileage. Of these three the last two are more or less under the control of the roads. Of greatest immediate value, assuming that the experience of last year will be repeated, is the possibility of maintaining a high rate of mileage restoration by means of capacity operation of our back shops. To get greater output it will be necessary either to increase working hours; increase the number of men or increase the productivity of available facilities. Unfortunately, this latter prospect is handicapped to a large extent by obsolete shop equipment.

If it is true that the man-power situation during the next year is going to present increasingly difficult problems then the immediate course seems reasonably clear. Again, we repeat the suggestion of last year, namely to get busy on a program of the necessary quantity of new equipment to provide a safe margin of capacity. Such new equipment must not only include motive power but the shop facilities with which to offset losses in man-power as the needs of our armed forces are met.



A Record Car Performance in 1942

Small increase in loadings probable in 1943—Material and manpower key to an effective freight-car supply

By C. B. Peck

Mechanical Department Editor

THE freight-car supply proved adequate to meet all traffic demands during 1942. The margin of reserve capacity, however, practically disappeared. Cars undergoing or awaiting repairs were reduced to 2.7 per cent at the beginning of October and 2.4 per cent a month later; surplus cars dropped from 39,000 at the beginning of the month to about 30,400 at the end of the month—an indication of an unprecedentedly high fluidity of the car supply. From the 1941 high of 43.2 in August, car-miles per freight car day climbed to 49.3 in September, 1942, and net ton-miles per car day for the first time in history exceeded 1,000 in September. Reflected in these ratios is a revolution in car utilization which has destroyed the value of old methods of appraising its intensity.

Comparability of Utilization Ratios Destroyed

For a number of years in the Annual Statistical Numbers of the *Railway Age* appraisals of the probable demand for freight cars during each Fall peak have been made by the use of two ratios—the number of cars on line per weekly carloading and the number of active cars per weekly carloading. These ratios are a measure of the intensity of utilization. They were satisfactory gages of the trends in car utilization as long as carloadings continued to be reported on a comparable basis year after year.

This comparability was destroyed when on March 24, 1942, ODT issued its General Order No. 1 requiring increased minimum l. c. l. loading in three steps reaching 10 tons after September 1. The index numbers could still be computed but they would have quite a different significance than would the same numbers in a preceding year.

A further factor tending to change the significance of these index numbers is the sharp upward trend in the average haul per ton of revenue freight loaded which has been under way during the past two years. The effect of this will be referred to later.

How this change in the number of l. c. l. cars loaded has affected the method heretofore used will be evident from a review of last year's estimate of 1942 freight-car requirements. This estimate was based on an expected increase of 10 per cent in the number of cars loaded. Had the 10-per cent increase been attained, the total carloadings for 1942 would have been 46,600,000 instead of the actual 43,000,000. But in the lower number are an increase of something over 9 per cent in the number of cars loaded with commodities moving in carload lots—an indication that the estimated 10-per cent figure was actually close to the increase in tonnage and that the estimated 46,600,000 would probably have been reached had the increase in the l. c. l. minimum car load not reduced the number of l. c. l. cars loaded during the year nearly 2½ million below 1941.

Assuming that a considerably larger proportion of the year's traffic would move during the first half of 1942 than moved during the first half of 1941, the number of active cars required to meet the maximum traffic movement during 1942 was estimated a year ago to be between 1,617,000 and 1,667,000 and the total cars on line to be between 1,731,000 and 1,781,000 as of October 1. Actually there were about 1,645,000 active cars and 1,730,000 cars on line in October, 1942. The total carloading for the year was only 43,000,000 instead of 46,600,000 as estimated, but because this difference was in a single loading classification calling for box cars alone, it did not represent anywhere near the relief on the car situation which the same difference distributed over all loaded classifications would have represented. The situation with respect to all but box cars was as tight as might have been expected from the actual increase of nearly 10 per cent in loadings of carload lots.

As the situation now appears, there seems to be little probability of an increase in loadings of car-load traffic during 1943 of more than a million or a million and a half over 1942. L.c.l. loadings may be a million cars less. Prospective car supply will meet the demand—*if:* (1) there is no large increase in troop movements; (2) there is no further tightening of inventories of material required for car repairs, and (3) car-repair forces are not depleted.

Effect of Longer Haul

The marked reduction in l. c. l. carloadings was not the only change affecting the pattern of freight-car utilization during 1942. Another factor to which reference has already been made is the increase in average haul. While the number of cars loaded with freight in carload lots increased between 9 and 10 per cent and l. c. l. loadings decreased almost 30 per cent, revenue ton-miles increased about 32 per cent, reflecting an increase in the average haul of about 51 miles—nearly 14 per cent.

This increase in the average haul, plus the accompanying empty car-mileage (about two points higher in 1942 than during the Fall of 1941), results in an average increase in the time moving in trains of about seven hours per loading cycle—half of the 14-hr. increase in the overall time elapsed between successive loadings. The quarterly average of the loading cycle during 1941 varied

between 12 and 13 days and was 0.6 of a day longer during the past year.

Carloading Pattern for 1942

Another factor affecting the intensity of peak traffic requirements during 1942 was the unusual seasonal distribution of traffic in some loading classifications and the relatively large increases in all classifications during the first half of the year as compared with the second half of the year. Comparing the carloadings by quarters, those in the large miscellaneous classification increased 14.6 per cent during the first quarter, 7.3 per cent during the third quarter, and just under 8 per cent for the year as a whole.

Coal, which, next to the miscellaneous, is the largest carload classification, increased 44 per cent in the second quarter of 1942. This reflected the effect of the coal strike during 1941. For the year as a whole, the increase was 10.4 per cent.

Ore loadings increased 13.1 per cent for the year; the largest increase was 15.6 per cent during the third quarter. This is the only large commodity classification in which the heaviest increase occurred during the third quarter.

In the case of forest products, the increase during the second quarter was 19.7 per cent; for the year as a whole it was 13.2 per cent.

Grain and grain products, in which there is usually a sharp and high peak of movement during midsummer, showed a 24.6 per cent increase over 1941 during the first quarter, with another less marked but sustained peak in the fourth quarter, running 21 per cent higher than last year. For the year as a whole, loadings in this classification increased but 7.3 per cent. Thus, the requirements for grain loadings, which are usually exceedingly acute for a short period during the summer, were widely spread throughout the year and the maximum single weekly loading was 6,500 cars fewer than the maximum of 1941.

While not reported separately in the carloading figures, the tank-car movement of petroleum products, particularly to the eastern seaboard states, has influenced the average figures pertaining to freight-car performance during the past year. Weekly carloadings of petroleum and petroleum products for movement into the eastern seaboard states, which seldom exceeded 4,000 until the end of January, 1942, rapidly built up after that date until they passed the 20,000 mark early in May, and during the peak movement of August and September reached a maximum of 28,557 during the week ended September 19. Most of the routes over which these cars move are well above 1,000 miles in length and several are over 2,000 miles long. This movement has thus been one of the outstanding factors responsible for the overall increase in average haul. These cars move in blocks of full train-load size as far as practicable and have been watched closely to see that they are kept moving and that no unnecessary time is wasted in loading and unloading. This extraordinary traffic movement has thus tended to effect an apparent improvement in average freight-car utilization somewhat greater than has actually been effected in the bulk of the movement in box and open-top cars.

The overall effects of these characteristics of the 1942 carloading pattern were a 13.5-per cent increase in all loadings of car-load lots in the second quarter of the year and an increase of 6.6 per cent during the third and largest quarter of the year. The railroads were thus able to handle an increase in car-load traffic of more than 9 per cent with a considerably smaller increase in peak demand. The leveling-out process, however, resulted in high sustained demands for many types of cars which were met only because of high standards of maintenance, the smallest percentage of cars out of service for repairs ever attained, and a high degree of shipper cooperation in the matter of heavy loading and prompt attention to loading and unloading.

Traffic Prospects in 1943

What are the prospects for an adequate car supply during 1943? At the outset, the answer to this question depends upon how much traffic will have to be handled. A year ago the entire industrial system of America was undergoing a revolutionary change in objectives and in the character of its products. That change was so rapid that in some respects it apparently overshot the mark and at present we are passing through a period in which a number of readjustments are being made. One of these readjustments is the completion of construction projects for the armed forces and of industrial expansion projects. How far will the recessions in traffic resulting from the completion of these activities be made up by the effect of the new facilities on the volume of industrial production? Will there be increases in the total volume of war production and, if so, will they be added to the present volume of total production or be effected by the conversion of additional manpower and manufacturing facilities from civilian production to war production? Upon the answers to these questions must depend the answer to the question of the adequacy of the supply of freight cars and of other railway facilities during 1943.

One appraisal of the probabilities may be made by a study of the carloading pattern during 1942. Miscellaneous car loads are the largest single classification. They comprise nearly all of the products of industry,

The Pattern of Freight-Car Demand—1941-1942

(Carloadings, in thousands, by Commodity Groups in Quarters)

	First Quarter			Second Quarter			Third Quarter			Fourth Quarter			Annual Totals		
Commodity group	1941	1942	Inc. or dec. (–)	1941	1942	Inc. or dec. (–)	1941	1942	Inc. or dec. (–)	1941	1942*	Inc. or dec. (–)*	1941	1942*	Inc. or dec. (–)*
Grain and grain products	411	512	101	493	468	–25	621	609	–12	498	575	77	2,022	2,164	142
Live stock	139	149	10	142	157	15	152	179	27	217	256	39	650	742	92
Coal	2,000	2,036	36	1,481	2,136	655	2,071	2,091	20	2,038	2,094	56	7,590	8,356	766
Coke	180	184	4	155	183	28	171	180	9	172	186	14	678	732	54
Forest products	496	577	81	539	645	106	600	672	72	549	549	..	2,185	2,443	258
Ore	170	190	20	902	1,014	112	985	1,139	154	626	686	60	2,682	3,029	347
Miscellaneous	4,027	4,613	586	4,671	4,909	238	4,811	5,165	354	4,926	5,042	116	18,436	19,730	1,294
Total car loads	7,423	8,261	838	8,383	9,512	1,129	9,411	10,035	624	9,026	9,388	362	34,243	37,196	2,953
Merchandise l.c.l.	1,964	1,892	–72	2,081	1,395	–685	2,006	1,142	–864	1,991	1,168	–823	8,041	5,597	–2,444

* Last two weeks of 1942 estimated.

including those on lend-lease account and all war material, as well as some products of mines, and are most directly responsive to changes in the level of industrial activity. The number of cars loaded in this group during 1942 increased just under 8 per cent over 1941. That there will be as large an increase during 1943 seems improbable.

There were 13 per cent more cars loaded with forest products during 1942 than during 1941. But these loadings showed a sharp decline during the last quarter of that year and fell below those of 1941 toward the end of the quarter. There would seem to be little prospect that the total movement of forest products during 1943 will exceed the 1942 figures; it might even show some recession.

Experience indicates that a maximum coal loading of 170,000 cars a week represents about the capacity output of the industry. If this figure, corrected for normal reductions during six holiday weeks, may be considered as the present potential of the industry, then the actual loadings during 1942 are within 4 per cent of capacity. If the industry goes on a six-day week during 1943, there may be some increase in capacity. Depletion of manpower and absenteeism on the sixth day, however, will probably offset a major part of it.

Ore movement is largely handled during the second and third quarters. This year's movement exceeded that of a year ago by 13 per cent and last year, itself, was a record year. A further increase next year is not likely to be large.

Grain and grain products required 7 per cent and live stock 14 per cent more car loads in 1942 than in 1941. Combined, these two groups of products of the farm increased 9 per cent. Unless there is a marked improvement in the manpower situation as it affects the farm, the increase in these two categories during 1943 is likely to be considerably less than last year.

As the situation appears at the present time, there seems to be little probability of an increase in loadings of all car-load traffic during 1943 of more than about a million to a million and a half cars more than in 1942. Continued heavy loading of l. c. l. cars will produce about one million fewer cars loaded with l. c. l. freight in 1943 than in 1942. No marked change may be expected, therefore, in the total number of cars loaded. Considering current trends in average car load and average haul, this conclusion is not inconsistent with current estimates of a 15-per cent increase in traffic, measured by net ton-miles.

One factor which it is difficult to evaluate, however, may modify these anticipated results; that is, troop movements. If the proposed program for an army of 7,500,000 men by the end of 1943 is carried out, there will undoubtedly be a considerable increase in the movement of troops and their materiel toward ports of embarkation as the year advances. This may throw additional demands on the supply of box, gondola and flat cars beyond the estimated increase of the million to million and a half cars of carload traffic to take care of increases in production and normal distribution.

Prospective Car Supply

The estimated increase of carload traffic will probably be divided approximately equally between house and open-top cars. The overall supply of the former will probably be adequate, but how about the supply of open-top cars? Material has been allocated for 20,000 open-top cars to be delivered during the first six months of 1943. To these must be added approximately 12,000 open-top cars authorized for construction during 1942 still not delivered on October 1, making a total additional supply of new cars available before the Fall peak of 1943 of 32,000. During the year ended last October 1, 4,500 open-top cars were permanently removed from service. If cars are removed for dismantling at the same rate during 1943, the net addition to the open-top car supply from October to October will be about 27,500. This number of additional cars should provide for not less than 17,000 additional loads per week. This is not a comfortable margin of protection against uncertainties for which no allowance has been made in the estimated average increase of 10 to 14 thousand car loads a week. One of these uncertainties has already been mentioned; i. e., the effect of troop movements to embarkation points. Another is the ability of car-repair forces to maintain the current high ratio of cars in good repair.

Low B. O. Ratio Not Easy to Keep

In mid October, 1942, 45,000 freight cars were undergoing or awaiting repair. In 1941, there were 26,500 more, or 71,700. This is by no means a high figure according to past records, representing only 4.4 per cent of the cars on line. It would not take a large shortage of materials or manpower, under the intensity with which freight cars are now being used, to start an accumulation of cars undergoing or awaiting repairs which would soon completely offset the effectiveness of the year's prospective increase in open-top cars on line.

For many years it has been the practice to accumulate sufficient cars at the shops by series so that systematized programs of heavy repairs could be carried out. This permitted the organization of facilities, the specializing of jobs and the close scheduling of material. With present low percentages of cars out of service for repairs, such systematized programs are now almost impossible. The shop must be prepared to take in cars of all types and conditions just as they come. This is not economical of manpower and a greater variety of materials must be carried in stock in adequate quantities if cars are to be turned out of the shop promptly. Curtailing of inventories which has been going on during recent months is tending to increase time needed for heavy repairs.

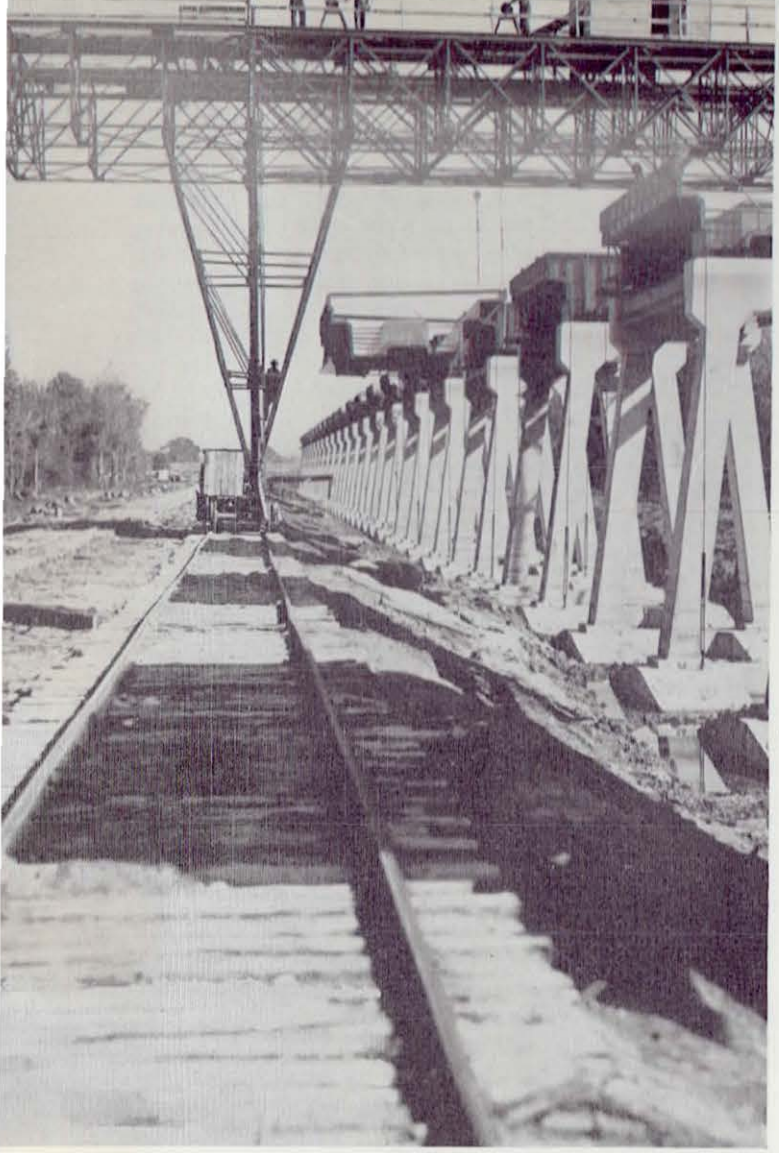
As the new year begins, the problem of securing adequate manpower promises to become as acute as that of securing new cars and maintenance material. Indeed, the same conditions threatening a manpower shortage on the railroads may quite possibly also prove a barrier to the delivery of all of the cars for which material has been allocated in time to be effective during the latter part of 1943 when demand is highest.

Our part in the world war has now entered a phase in which the demands for munitions have become fluid. Long-range plans fixing relative amounts of the vast number of items of arms, ammunition, and other military supplies may have to be modified frequently and suddenly. These changes, in turn, may affect the amount of transportation service required and will undoubtedly require changes in its character. They may also change the relative demand for various materials. The needs for new transportation facilities will, therefore, require periodical reappraisal, perhaps several times a year. The prospects that these needs will be adequately considered as a vital factor in the national war effort has been greatly improved by establishing ODT as one of the so-called claimant agencies under the CMP plan for the control of the distribution of certain basic materials. It appears equally desirable that ODT achieve a similar position with the agency allocating manpower.

Construction and Pace Must

By Neal D. Howard

Engineering Editor



A Long, High-Line Viaduct Over a Floodway Was One Of the Important Railway Projects Carried Forward During 1942

THIRTEEN months of war-time traffic that reached an unprecedented peak during the latter half of 1942, have taken a record toll of the fixed properties of the railways, and the new year is finding their construction and maintenance forces battling determinedly to hold their own under conditions that promise to become even more severe during the year that is ahead. In spite of shortages in many vital materials, shortages of essential work equipment, and, more recently, shortages of labor, that are reaching serious proportions in certain parts of the country, these forces have met the needs of the moment. But has that been enough?

What is the state of the fixed properties of the railways today? And what of the year ahead? If resolve and determination were the only factors involved, these questions could be answered optimistically and with assurance, because in resolve and determination to meet the war-time demands, the construction and maintenance forces have not been and will not be found wanting—but, unfortunately, other more tangible factors have played and will continue to play an important part in the picture.

Situation Better—But

At this time a year ago, it could be said that the physical properties of the railways were in a stronger position than they were at the beginning of 1940. However, if they had been called upon to carry the war-time traffic of 1942 in 1941, or in any of the depression years immediately preceding, the effect upon our war effort might have been disastrous. But traffic increased materially in 1941, and, in keeping with the long-standing policy of the railways of plowing back into their properties a substantial part of current earnings, larger sums were expended currently for roadway and structures improvements and maintenance in that year than in any year since 1930, with the single exception of 1937. With the onset of the war, traffic again surged upward and continued to climb throughout 1942, and with it, expenditures for additions and betterments and for maintenance of way and structures increased further, limited only by the inability of the railways to secure war-critical materials essential to many of these improvements.

But these statements, standing alone and without further analysis, are misleading as to the adequacy of the fixed properties of the railways at the beginning of 1942, and distort the picture of their adequacy at the beginning of 1943. Considering the situation first from the standpoint of the capital improvements that have been made to improve these properties, it must be recognized at the outset that relatively large expenditures for such improvements during one year, or even during two years, cannot restore any property or properties to adequacy after a prolonged period of forced curtailment in expenditures. To point out that the railways spent approximately $175,-

Is Maintenance Lagging?

This article reviews the construction and maintenance activities of the railways during recent years, and, more particularly, the last year, to ascertain the state of the fixed properties after thirteen months of war traffic, and their prospective needs in the year that is ahead. It shows clearly that expenditures were up during 1942 for all classes of improvement and maintenance work, but, with equal clarity, that in view of long curtailed expenditures, and certain increased needs of our war effort, the railways must have more material and labor, and must spend more for both construction and maintenance.

Maintenance Up in 1942—Increase to Meet War Demands

Review shows that, despite larger expenditures for improvements and upkeep, fixed properties are failing to keep up with traffic requirements

450,000 for capital improvements of their fixed properties in 1941, the last year for which figures are available, and a still larger amount for such improvements in 1942, is, by itself, impressive, but the true picture of the over-all situation with respect to the fixed properties can be gained only by consideration of these expenditures in the light of the expenditures that the railways have made for additions and betterments over a considerable period, not overlooking the changes in operating methods and variations in traffic demands that have taken place within this period.

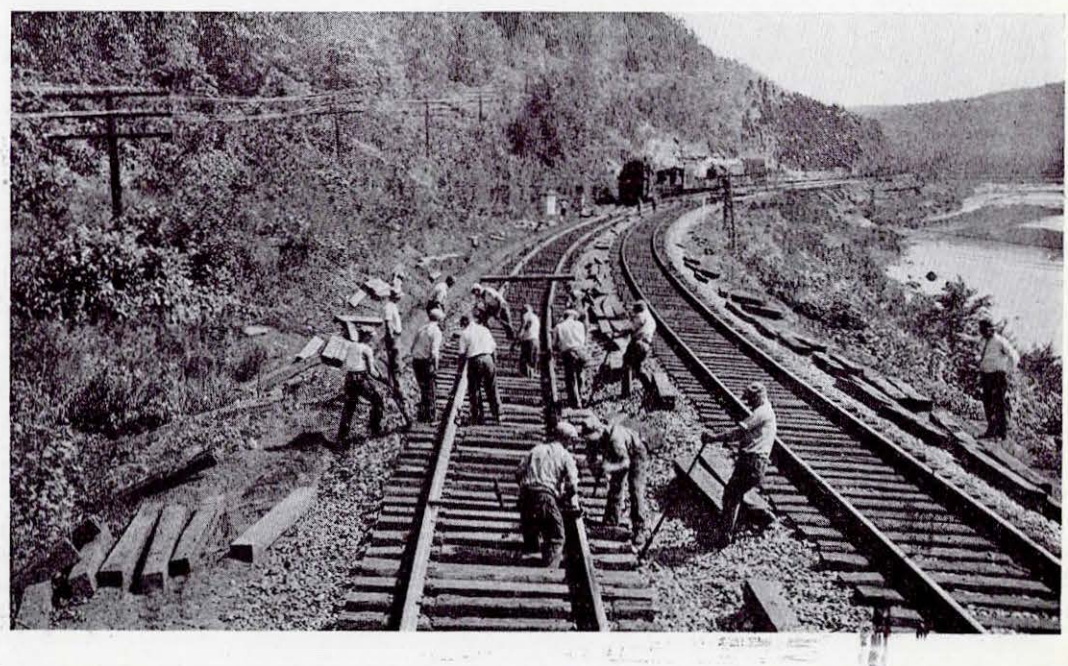
Past Capital Expenditures Reviewed

Such a review shows that whereas the annual gross expenditures of the Class I railways of the country for additions to and betterments of their fixed properties (not net additions) averaged $461,848,250 in the years 1923 to 1930, inclusive; annual expenditures for these same purposes in the eleven years 1931 to 1941, inclusive, averaged only $159,833,636, or less than 35 per cent as much. Assuming that the expenditures in 1942 were as much as 20 per cent higher than those in 1941, the average annual expenditures for additions and betterments for the last twelve years are raised to only $164,059,466, or still only approximately 35 per cent as much as they were in the eight years 1923 to 1930, inclusive. On the basis of these latter figures, the railways spent $297,788,784 less annually during the last twelve years for additions to and betterments of their fixed properties than they did in the preceding eight years.

These figures indicate unmistakably that in the years since 1931, the railways, in spite of radical changes in operating methods, calling for higher train speeds and improved service generally, have consistently deferred improvements annually to the extent of many millions of dollars because of lack of sufficient earnings to make them possible. The larger expenditures of the last two years have improved the situation materially, but there still remains a large backlog of improvements to main tracks, branch-line tracks, sidings and passing tracks, bridges, buildings, fuel and water stations, and to a wide range of yard, shop and terminal facilities—improvements that are essential to maximum efficiency and service under the peak traffic that the railways are experiencing, and imperative, in many instances, in view of the character of much of that peak traffic—the very sinews of our country's all-out war effort.

Railway engineering officers do not need to be told of these shortcomings of the railroad plant today—neither do railway managements need to be "sold" to the present needs on the basis of increased efficiency or economy of operation. Both of these classes of officers fully realize the need and the advantages to be gained, and railway earnings justify expenditures far beyond those of many years in the past. Furthermore, in the light of the transportation job that must be done to sustain the war effort, a job that only the railways can do, the railways are not counting the cost as in normal times.

Today, the factor that is limiting the undertaking of needed additions and improvements more than any other is the shortage of materials—steel, copper, nickel, tin, rubber, structural timber, and others that are needed in vast quantities by the huge armament and shipbuilding programs of the country. Second only to this is a short-



Heavy Maintenance Programs Must Be Undertaken in 1943 if the Track Structure Is Not to Restrict the War Transportation of the Country

age of labor, a factor that is becoming increasingly important, and which may well become the most restricting factor following the completion of the plant construction phases of our war program and the calling of additional hundreds of thousands of war workers into actual production. But if the railroads are to continue to carry the present essential war transportation load, with the further increases that are predicted in that load, unnecessary restrictions in materials and labor must not be allowed to cripple their efforts; there must be a more equitable distribution of the resources of materials and labor that are available because essential railway improvements must continue.

Much Still To Be Done

During the last twelve months, the Chicago, Burlington and Quincy completed westbound classification facilities at its large Galesburg (Illinois) yard—a project that, under present traffic, is saving thousands of car-days and hundreds of locomotive-hours a month, and thus easing substantially the demand on the overtaxed locomotive and freight car supply of the country. Not only that, but traffic has been materially speeded up.

During 1942, the Norfolk & Western completed the construction of important additions to its already extensive yard facilities at Portsmouth, Ohio, and made important additions to its large yard facilities at Roanoke, Va., both of which projects will contribute materially to the already large contribution which this road is making to the war effort of the country. Many similar projects of varying magnitude await only the release of the necessary materials to start them under way, enabling other roads to contribute more largely in meeting the war's demand for transportation.

During 1942, the Pennsylvania made extensive improvements on its St. Louis division between St. Louis, Mo., and Indianapolis, Ind.—extending double track, building 150-car sidings and improving signaling—which will greatly expedite the handling of both freight and passenger traffic moving through this important gateway. This is another example of classes of improvements that are begging for attention on many roads in the interest of adequate war transportation.

And so the story goes—as a result of the near stagnation of construction during the depression years on the one hand, and the present unprecedented demands of traffic and modern train operation on the other, there are hundreds of projects involving tracks, bridges, buildings and water and fueling facilities, at terminals and out on the line, affecting the speed and efficiency of train operation, the intensive use of cars and locomotives, and the comfort and facility of handling a record passenger traffic, military and civilian, that await only the release of the necessary materials to put them under way—and while they wait, the war effort waits, or is in potential jeopardy.

Need Many Materials and Facilities

From the standpoint of fast and safe train operation, with a minimum number of bottlenecks and slow orders, it is particularly essential that the track rails be of adequate section; that ties and ballast be adequate and in good condition; that drainage be sufficient to insure stability of the roadbed; that excessive curvature and sharp turnouts be removed where they are speed-controlling factors, etc. These factors are mentioned because it is a well known fact that while many miles of main tracks entered the war period adequate to current needs, and that will remain adequate, assuming proper maintenance, there are other many miles of main and secondary tracks that were not adequate for the loads and traffic that were being impressed upon them, and that have not been brought into line with demands.

Unfortunately, the same can be said of many bridges, which, in their relation to the safety and integrity of train operation, are equally as important as the track itself. On the whole, bridges have received relatively favorable attention, but for the same reasons that caused several roads to carry out extensive programs of bridge strengthening and repairs during the last two or three years, to bring their structures into line with changed operating conditions and demands, other roads are faced with similar programs as main line traffic, speeds, and loads increase, and as many branch lines, due to war developments, are being called upon to carry classes of power and a density of traffic for which they were neither built nor maintained.

No less essential are adequate locomotive fuel and water facilities—and more important today than ever before as both assume increased importance with faster train schedules and the more intensive use of motive power. As regards locomotive water supplies, much has been done during the last decade to improve quality through proper treatment. Today, it is evident that without that improvement, the marked advances that have been made in locomotive utilization through reduced failures, reduced routine maintenance and improved performance generally, could not have been achieved. Likewise, much has been done to assure the integrity of certain supplies and to increase the quantity of others—and to adjust water delivery points to new operating requirements. However, today, with the operating picture changed or changing materially on many lines from what it was only a year or two ago, and with water demands up almost everywhere, many roads still face sizeable programs of water improvements if this critical element of railway requirements is not to limit the overall capacity of the railways to meet the war-time load.

Ingenuity in Improvising

The fact that the railways have accomplished such striking results in improved operation and performance in recent years, and especially since the onset of the war—in spite of their unfilled needs for new and improved facilities—can be attributed largely to the initiative, energy and ingenuity of their officers and employees. Through consolidation, rearrangement, standardization and reclamation, often employing make-shift methods and second-hand materials, they have stretched the capacity of existing facilities beyond what was considered possible only a few years ago. And to the extent that there is any more stretch in these facilities, engineering and maintenance officers will continue to stretch them. But, in the face of constantly increasing demands of a vital nature, it would be foolhardy to believe that this process can be continued indefinitely, without risking congestion, delays, and even breakdowns and accidents, at a time when the war effort demands a transportation plant at its peak.

What has been said relative to the need for improved and additional elements of the fixed properties of the railways applies with equal force to the maintenance of their existing facilities—their main tracks, their important secondary tracks, their sidings and yard tracks; their bridges, their buildings and many miscellaneous facilities. Inadequate attention to what the railways

already have in essential facilities will soon lead to accelerated deterioration, with the added waste of critical materials that this will involve, and this can be even more serious than the failure to provide additional facilities.

Many of the main tracks of the country have been given a disproportionate amount of attention relatively during the last decade of reduced earnings to keep them abreast of the increased tempo of train operation. But this very fact too often required the neglect of many miles of other main tracks, and of branch lines almost generally. Thus, a large mileage of the tracks of the country still reflect the depressed earnings of the depression years, a situation that cannot continue to prevail under the peak war traffic of today without serious jeopardy to that traffic.

The same situation prevails with regard to the maintenance of practically all the other elements of the fixed properties. Only as the urgency of traffic or operating conditions demanded, were they given anywhere near the attention they needed in the "get by" era of the "thirties," a situation that left many of these facilities below a normal state of repair, and continuing to deteriorate under the more intensive use that is being made of them today—in spite of the larger expenditures that have been made for the maintenance of roadway and structures during the last two or three years.

In 1942, on the basis of actual expenditures for the maintenance of roadway and structures for the first ten months, which are all that are available at the time this article is written, it appears that expenditures for the year as a whole were in excess of $790,000,000. These expenditures, which exceed those for similar purposes in any year since 1929, coming on top of expenditures totaling $603,088,381 in 1941, have had an important influence for the better on the general condition of various elements of the fixed properties. However, following depression spending of less than half as much annually, their effect has been to improve a subnormal condition, rather than to restore fully earlier losses.

Program Unbalanced

Furthermore, because of shortages in many critical materials, the maintenance programs in 1942 were seriously unbalanced in the light of specific needs, emphasis being placed often on those classes of work that could be done without, or with the minimum use of, critical materials. Thus, for example, lacking sufficient new rail to meet the demands of traffic, many roads turned to larger programs of bank widening, ballasting, ballast cleaning, and rail end and rail joint reclamation, in an attempt to reinforce and hold over a track structure in need of new rail. Likewise, more attention was turned to general building maintenance, frequently without regard to the most pressing needs.

Maintenance Expenditures Compared

That the fixed properties, of necessity, have been undermaintained during the last decade or more is seen clearly in the expenditures made for this purpose during this period, compared with expenditures for similar purposes made in the years immediately preceding the depression. During the twelve years from 1931 to 1942, inclusive, these expenditures by the Class I railways of the United States (including switching and terminal companies) averaged only approximately $474,237,300 annually, whereas during the five years ending with 1929, the annual expenditures of these same roads for the same purposes averaged $849,021,000, or more than one and three-quarters times as much—and this reduction was made in the face of extensive changes in operating conditions, a general revival in business and nearly 13 months of all-out war effort during the last two years, that has seen traffic on the railways break all previous records.

The manner in which this large deficiency in maintenance expenditures is distributed among the various elements of the fixed property is indicated in one of the accompanying tables, which gives for the principal elements, a comparison of expenditures for maintenance in the years 1932 to 1941, inclusive, with the average of those in the years 1925 to 1929, inclusive.

In roadway maintenance, it is seen that average annual expenditures for the years 1932 to 1941, inclusive, were only $36,853,000, as compared with average annual expenditures of $83,698,000 in the five years 1925 to 1929, inclusive, a reduction of approximately 56 per cent. In bridges and culverts, the corresponding average annual expenditures for the period 1932 to 1941, inclusive, and 1925 to 1929, inclusive, were $23,740,000 and $43,471,000, respectively, a reduction of approximately 45 per cent; for ties, the corresponding average annual expenditures were $54,952,000 and $114,859,000, respectively, a reduction of approximately 52 per cent; for rail, the corresponding average annual expenditures were $18,830,000 and $47,402,000, respectively, a re-

Expenditures for Maintenance of Way and Structures, Class I Railways

(Thousands)

	Average 1925-1929 (Inclusive)	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
Superintendence	$57,262	$36,552	$31,921	$33,347	$35,605	$37,357	$39,801	$38,935	$39,072	$40,231	$43,407
Roadway Maintenance	83,698	32,042	30,026	30,714	35,809	38,289	42,017	37,219	36,112	38,372	47,923
Tunnels	2,608	1,466	933	1,051	1,453	1,326	1,709	1,256	1,210	1,374	1,780
Bridges, culverts, etc.	43,471	19,434	17,627	20,139	22,646	24,032	26,268	24,200	24,782	26,514	31,754
Ties	114,859	50,294	43,543	50,748	51,936	56,315	59,799	53,762	59,910	58,353	64,928
Rails	47,402	13,762	14,324	15,418	16,302	21,192	20,412	17,406	22,065	22,736	24,684
Other Track Materials	48,354	15,726	15,362	18,694	20,959	26,732	30,228	22,817	29,670	33,428	38,711
Ballast	19,379	4,969	5,814	7,538	8,357	11,992	12,362	7,744	10,343	11,592	15,093
Track Laying and Surfacing	211,067	83,407	77,025	85,641	94,033	106,072	121,113	103,420	114,932	117,839	156,142
Fences and Snow Sheds	5,831	2,135	2,047	2,412	2,260	†3,397	†3,689	†2,939	†3,235	3,408	3,930
Crossings and Signs	13,115	6,468	5,969	7,293	7,186	*	*	*	*	*	*
Buildings	79,000	24,924	24,576	31,448	33,047	41,252	47,757	34,315	41,018	46,852	60,412
Water Supply	10,444	3,952	3,749	4,441	4,497	5,860	6,182	4,672	5,207	6,020	6,736
Tools and Equipment	18,230	7,917	8,051	10,666	11,044	13,452	15,408	11,456	13,720	15,434	18,971
Injuries	5,907	2,811	2,417	2,810	2,727	3,118	3,303	2,806	2,929	3,220	3,547
Removing Snow, Ice and Sand	9,947	4,699	4,188	5,630	7,001	13,365	6,655	5,239	6,110	9,030	5,995
Miscellaneous	78,449	40,621	34,714	37,310	39,105	51,059	58,891	51,961	56,516	29,202	79,076
	$849,021	$351,179	$322,286	$365,300	$393,967	$454,810	$495,594	$420,147	$466,831	$497,031	$603,088

Note; Miscellaneous includes signals and interlocking, all charges for depreciation and unclassified items.
* Not shown separately since 1935. † Includes signs, as well as fences and snow sheds.

duction of approximately 60 per cent; for track laying and surfacing, the corresponding average annual expenditures were $105,962,000 and $211,067,000, respectively, a reduction of approximately 50 per cent; for buildings, the corresponding average annual expenditures were $38,560,000 and $79,000,000, respectively, a reduction of approximately 51 per cent; and for water supply, the corresponding average annual expenditures were $5,132,000 and $10,444,000, respectively, a reduction of approximately 51 per cent.

Rail Renewals

With rail of critical importance at the present time, further analysis of the rail situation, as is possible in another of the accompanying tables, is of interest. From this table, which lists gross tons* of rail applied in renewals by the Class I roads in the years 1925 to 1942, inclusive, it is observed that while the amount of new rail laid in replacements in 1942, amounting to approximately 1,210,000† gross tons, is larger than was laid in any year since 1930, it is still little more than half the amount laid in any one of the years 1925 to 1928, inclusive. This fact is particularly significant in view of the volume of traffic in 1942, which exceeded that of any of the years 1925 to 1928, inclusive.

Rail Applied in Renewals—Class I Roads

	Gross Tons		Gross Tons
1925	1,950,146	1934	631,093
1926	2,209,873	1935	582,794
1927	2,124,765	1936	921,298
1928	2,080,277	1937	1,029,861
1929	1,958,489	1938	599,752
1930	1,517,002	1939	878,643
1931	984,900	1940	998,914
1932	394,536	1941	1,197,593
1933	403,254	1942	1,210,000*

* Estimated.

Concern over the new rail situation in 1942 led W. W. Kelly, director of the Section of Materials and Equipment, Office of Defense Transportation, to point out to the roadmasters at their annual meeting last September, that whereas in the 10 years from 1922 to 1931, an average of 1.74 net tons of new rails were laid in replacements per million gross-ton-miles of freight traffic handled, only 0.87 net tons of new rails per million gross-ton-miles were laid in replacements in the years 1932 to 1941, inclusive, or only half as much. Commenting further he said, that "the amount of new rail to be laid in 1942 is below any average we may assume as being necessary, especially in view of the enormous increase in traffic we are now experiencing over that of previous years."

For replacements in 1943, the railways have estimated their requirements conservatively at 1,869,000 gross tons (2,100,000 net tons). Thus far, the War Production Board has authorized the rolling for delivery in the first quarter of the year of 427,200 gross tons (480,000 net tons). Assuming equal allotments in the other three quarters of the year, which seems to be the general understanding of the possibilities, this would indicate that the railways will receive 1,708,800 gross tons (1,920,000 net tons) for the year as a whole.

Unquestionably, this larger tonnage of rail in 1943 will stand the railways in good stead, but its adequacy must be viewed in the light of past deficiencies, the peak passenger and freight traffic being carried, and the increasing failures and derailments of the last year.

Future Tie Situation Serious

As regards ties, the situation is shown in another table accompanying this article. The Class I roads inserted approximately 49,500,000 ties in 1942, a larger number than were inserted during any year since 1930; this brought the average number of ties applied in renewals for the 12 years 1931 to 1942 to approximately 44,795,000 annually, about 59 per cent as many as were inserted in tracks annually in the years 1925 to 1930, inclusive, when tie renewals averaged 76,200,000.

Unquestionably, in view of the reduced volume of traffic during the depression years, with its reduced wear and tear on the tracks, as well as the outstanding advances that have been made in prolonging the life of both rail and ties and in carrying out maintenance work, the foregoing figures of maintenance expenditures and of rail and tie replacements exaggerate the under-maintenance. However, allowing liberally for all of those factors that have reduced wear and tear and have otherwise prolonged the life of both rails and ties, it is an unescapable fact that the rail and tie conditions generally have not only not been brought back to normal following the starvation diet of the depression years, but are not now holding their own with the wear and abuse of current traffic.

Crossties Applied in Renewals—Class I Roads

1925	82,716,674	1934	43,306,205
1926	80,745,509	1935	44,351,900
1927	78,340,182	1936	47,361,015
1928	77,370,491	1937	47,729,538
1929	74,679,375	1938	41,363,224
1930	63,353,828	1939	45,088,278
1931	51,501,659	1940	43,620,653
1932	39,190,473	1941	47,224,593
1933	37,295,716	1942	49,000,000*

* Estimated.

Furthermore, with inadequate tie stocks on hand now, the outlook for adequate tie renewals in 1943, to hold the present level of maintenance and to strengthen the foundation of many tracks needing such strengthening, is anything but bright, and for 1944, the outlook is serious. Due to a variety of conditions affecting the tie producing industry, which are cutting the rate of tie production seriously—as much as 65 per cent in recent weeks in areas of largest production—there is grave concern that the tie supply for 1944 renewals will be grossly inadequate, auguring a serious deficiency in track maintenance in that year unless the present low rate of tie production is overcome—and overcome promptly.

Work Equipment Essential

That the fixed properties of the railways are in as good condition as they are today, in spite of the lean expenditures on their upkeep during the depression years and the restrictions that have held down the acquisition of many maintenance and repair materials during the last year, can be attributed to many factors, some of which have already been mentioned. But of all of these factors, none has had a more pronounced effect than the extensive use that has been made of power tools and equipment, with the revolutionary changes in maintenance methods, the increased production, and the more permanent character of work that has resulted. In fact,

(*Continued on page 31*)

* Contrary to the long established practice of the railways of referring to rail tonnages in terms of gross tons (2240 lb.), the War Production Board has introduced the unit of net tons (2000 lb.). Conforming to practice in past years and to permit comparisons with figures for past years, the figures given in this article are gross tons, with corresponding net tons included in parentheses.

† The War Production Board allotted the railroads 1,121,400 gross tons (1,260,000 net tons) of rail for replacements in 1942, all of which was laid, together with some rail held over from 1941, bringing the amount laid to approximately 1,210,000 gross tons.

Railroads Prepare for Post-War Era

A.A.R. sponsoring comprehensive research program with view to ascertaining how the industry can best meet future problems; and 'tis well—for the New Dealers have plans, too

By Walter J. Taft

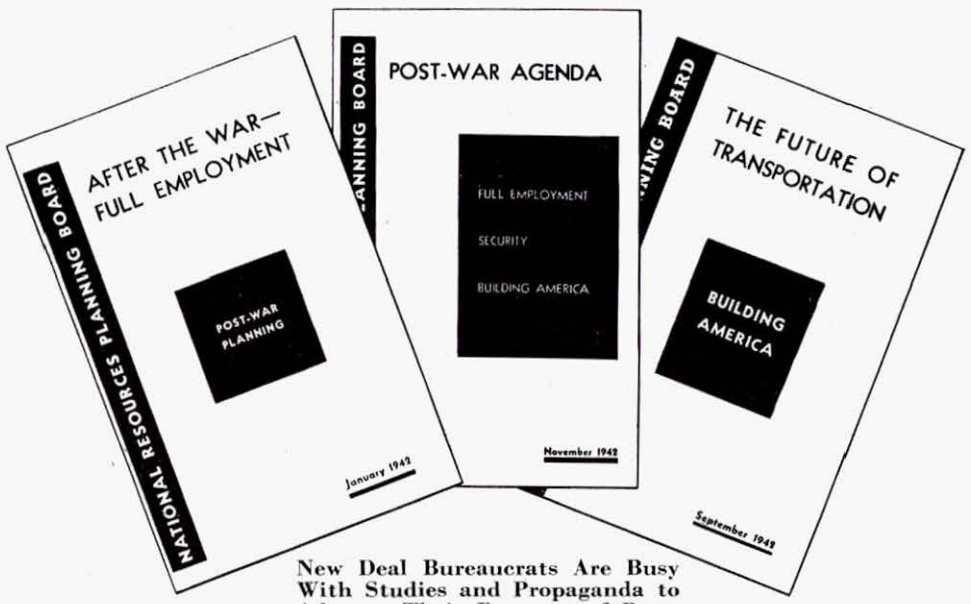
Washington Editor

POST-WAR planners among the New Dealers in Washington are already numerous and active, leaving private enterrpise with the alternatives of planning for itself or being planned for in that grandiose manner which appeals to those who like to talk about "balancing the budget of human needs" while at the same time remaining unconcerned with the sordid details of double-entry bookkeeping.

It is, therefore, fortunate that many industries, including the railroads, are doing much realistic thinking about post-war economic problems. Underway are several research programs, seeking individual-company and individual-industry answers which, it is hoped, may blend into private enterprise's composite solution to the fundamental problem of findings ways to provide peacetime full employment without paying the price of submitting to regimentation or dictatorship.

Current research activities of the railroads fit neatly into this concept. While individual roads are pursuing investigations of their specific situations, the Association of American Railroads is sponsoring a study of post-war problems with a view to ascertaining the facts and their bearing on the future of the industry. This A. A. R. study is just getting organized under the direction of Vice-President R. V. Fletcher, who is chairman of a representative general committee comprised of railroad officers and executives of the Railway Express Agency and the Pullman Company. B. H. Meyer, former member of the Interstate Commerce Commission, is consultant to the committee, while its staff includes Lloyd J. Kiernan, former railroad statistician of the Equitable Life Assurance Society, who will work with the subcommittee on post-war economic conditions. Additional staff assistants will be employed from time to time and assigned to other sub-committees, 16 of which have already been set up.

In addition to Chairman Fletcher, the members of the general committee are: E. E. Adams, vice-president, Pullman Company; V. S. Andrus, assistant to president, Southern Pacific; F. D. Beale, assistant vice-president, Chesapeake & Ohio; G. T. Carmichael, vice-president and comptroller, New York, New Haven, & Hartford; Fred Carpi, assistant to general traffic manager, Pennsylvania; H. R. Clarke, chief engineer, maintenance of way, Chicago, Burlington & Quincy; R. E. Connolly, vice-president, Illinois Central; J. R. Coulter, chief traffice officer, St. Louis-San Francisco; George M. Crowson, assistant to president, I. C.; Harry T. DeButts, vice-president, Southern; R. E. Dougherty, vice-president, New York Central; J. V. B. Duer, assistant to vice-president, P. R. R.; J. J. Ekin, vice-president and comptroller, Baltimore & Ohio; W. D. Faucette, chief engineer, Seaboard Air Line; Karl W. Fischer, assistant to president, C. B. & Q.; F. R. Gerard, vice-president and



New Deal Bureaucrats Are Busy With Studies and Propaganda to Advance Their Program of Post-War Socialism, Including Government Ownership of Railroads

general manager, Lehigh Valley; W. S. Hackworth, assistant to president, Nashville, Chattanooga & St. Louis; George W. Hand, assistant to chief executive officer, Chicago & North Western; C. R. Harding, assistant to president, S. P.; V. R. Hawthorne, executive vice-chairman, Mechanical Division, A. A. R.; Joseph H. Hays, counsel, Western Association of Railway Executives.

Also, L. O. Head, president, Railway Express Agency; Robert S. Henry, assistant to president, A. A. R.; L. W. Horning, manager of personnel, N. Y. C.; Edwin F. Hunt, assistant general counsel, N. C. & St. L.; W. S. Lacher, secretary, Engineering Division, A. A. R.; H. R. Lake, general manager, Department of Highway Motor Transport, Atchison, Topeka & Santa Fe; R. J. Littlefield, superintendent of motor service, P. R. R.; Daniel P. Loomis, executive director, Association of Western Railways; Carleton W. Meyer, assistant to president, N. Y. C.; Ben F. Morris, assistant to vice-president, Louisville & Nashville; J. P. McDonald, general statistician, Santa Fe; Julius H. Parmelee, director, Bureau of Railway Economics, A. A. R.; J. B. Parrish, assistant vice-president, C. & O.; A. E. Perlman, chief engineer, Denver & Rio Grande Western; J. W. Severs, assistant to trustee, Chicago, Milwaukee, St. Paul & Pacific; C. E. Smith, vice-president, New Haven; Elmer A. Smith, senior general attorney, I. C.; J. M. Symes, vice-president, P. R. R.; John B. Tigrett, executive assistant, Gulf, Mobile & Ohio; W. G. Vollmer, executive assistant, Missouri Pacific; F. J. Wall, vice-president, New Haven; John G. Walsh, vice-president, S. P.; L. F. Whittemore, assistant to president, Boston & Maine.

Sixteen Sub-Committees Planned

Sub-committees already organizing include those on traffic, operations, engineering, mechanical problems, water transportation, highway transportation, pipe line transportation, air transportation, taxation, legislation, public relations, post-war economic conditions, labor and personnel, finance, accounting, and statistics. This set-up contemplates an even broader participation by railroad officers than is indicated by the list of general committeemen; because the selection of those to serve on sub-committees is not being confined to the general committee's membership. Also, the A. A. R.'s Bureau of Railway Economics is very much in the picture, and it is expected to do a great deal of the research work.

Beyond this outline of its organization, the A. A. R. committee has not advanced far enough in the work to indicate anything more of its plans. It is nevertheless obvious that the committee has taken on a comprehensive research job, and has set out to do it in thoroughgoing fashion. So the railroad industry may be expected to be in the forefront among those who will have something to offer in the way of a substantial contribution to post-war economic thinking from the private-enterprise point of view.

Meanwhile such contributions will be in competition with the schemes of the government planners. While most any government agency is apt to come forward at any time with some sort of a transportation report, the expected activity in the field will come from the Board of Investigation and Research created by the Transportation Act of 1940 and the National Resources Planning Board, which has already issued its transportation report, publishing the summary as a pamphlet in its "Building America" series. These will be discussed below, for it should be pointed out here that the Board of Investigation and Research has the support of the railroad industry which favored its creation and has continued to give it full cooperation.

Effect of War on Study Board's Viewpoint

B. I. R. is not in any sense a manufacturer of post-war plans; but it would seem that its specific assignments to study the relative economy and fitness of rail, motor and water transportation, public aids to carriers, and the impact of taxes on carriers would not be pursued in realistic fashion if they failed to include an examination of wartime transportation, its lessons, and the effect on the nation's future transportation system. Thus the Board is understood to feel that the war has highlighted the importance of its investigations, leaving it, for example, with such jobs as that of appraising the carriers' wartime practices with a view to determining which of them might be continued in the interest of better co-ordination or more efficient operations.

The effect of the war on the Board's work was discussed briefly in its annual report for the year ended September 18, 1942, which described the situation in this way: "The entry of this country into the war has complicated the problems which the Board is directed to study, but has not changed their essential character. The scarcity of trained personnel and the burdens imposed upon the carriers by wartime demands have in some ways increased the difficulties of the Board's investigations. Yet the war has emphasized the importance of the work and has facilitated it in some important respects. It has made available recent data concerning the capacity of our transportation facilities. It has already brought forth new operating methods and has tested expedients which otherwise could be dealt with only in theory. These experiences are of great value in considering methods of developing a national transportation system adequate for the present and future needs of commerce and national defense."

Earlier last year, Board Chairman Nelson Lee Smith had expressed similar views in an address before the Traffic Club of Baltimore, Md. He asserted that adjustments made necessary by the war effort, "and those which must inevitably be made after victory has been achieved make it even more essential than ever before that serious and painstaking thought, based on a full and complete analysis of all the pertinent facts, be given to the problems which the Board has been directed to investigate in order that there may be given to the President and the Congress an adequate basis for a future national transportation policy in the public interest."

Wartime Traffic Hasn't Solved Transport Problem

Later on in the same address Mr. Smith directed attention to what he called "the mistaken belief that the present prosperity of the railroads, and other forms of transportation which benefit from this feverish industrial activity, has finally solved any major problems in the transportation system." Also he referred to what he considered another fallacious belief that "the changes now in progress are temporary, and that, once the war ends, the transportation system will revert to the conditions of 1938 or 1939."

"There are changes taking place everywhere every day which are bound to alter permanently the composition of industrial traffic," he continued. "For example, there is the decentralization of industry, which is opening new fields and building new centers of production in state after state. Conversion of new plants from armament to peacetime uses may result in production which

in some cases will be closer to sources of materials and in other instances nearer to markets than former industrial locations, but in either event will profoundly affect the pattern of national transportation requirements. The permanent transportation plant, canals, highways, railway roadbeds and terminals, will need readjustments which may surpass all present estimates in number and extent. Whether we can meet these new conditions with the necessary initiative and foresight will be a test of our American capacity . . . to discern in the shadowy future enormous social and industrial changes in the organization of the country, and to devise new means to meet new problems."

In the latter connection, the B. I. R. chairman was optimistic; for he has found most transportation men "convinced of the necessity of facing the problem of planning for the future insofar as that future can be seen with reasonable clarity." And he is gratified that "many of them believe that the Board of Investigation and Research can perform a truly constructive service in this field."

National Resources Board Has Ideas

As noted above, the National Resources Planning Board has published its transportation report which is a document of 507 two-column pages (see *Railway Age* of November 7, 1942, page 448); and it has given the summary of that report a place in the "Building America" series. The report is a series of treatises by members of the Resources Board staff and others retained for work on the study, while the summary was prepared by the study's director—Ralph J. Watkins. The only recommendation of the report which the Board itself endorses is that calling for establishment in the post-war period of a permanent National Transportation Agency "to co-ordinate all federal developmental activities in transportation along the lines of a general and progressive plan under appropriate legislative directives." The report enters the post-war-planning picture because President Roosevelt has sent it to Congress particularly "for the consideration of the several committees . . . which are and will be concerned with the formulation of plans and policies for transportation and for the economy generally in the transition period that we shall face."

Earlier last year, Congress had received a preview of the report in the transportation chapter of a general planning report which the Board published last January. That called government ownership in the post-war period of all rights-of-way of transport agencies an "urgent need" if a "properly conceived modernization of the transportation plant as a whole" is to be achieved. In other words, private ownership of railroad rights-of-way is one obstacle in the way of planners who would make post-war construction and reconstruction of rail facilities eligible for large government expenditures. The same idea was discussed in the transportation report, but the specific recommendations left to the proposed Transportation Agency the job of devising "suitable means" whereby public-works programs may be extended to the railroads.

Other recent Resources Board reports of interest to the railroads include "After the War—Full Employment," by Dr. Alvin H. Hansen, Littauer professor of economics at Harvard University, and "Post-War Planning." The Hansen pamphlet anticipates that in the post-war period this country will be faced with "plenty of work to do," including the need "to rehabilitate and modernize our transportation system—by land, water, and air." "Post-War Planning" contemplates "major developments in the transportation field after the war in order to provide a mainspring for other kinds of developmental work throughout the nation."

Planning for Post-War Highways

Among other things that pamphlet also mentions Public Roads Administration plans for interregional highways and other projects. Whereupon PRA came forward about the same time with an announcement revealing that it had "well under way" what it called "the first actual engineering work on post-war public construction." The latter, it seems, is to be a $500,000,000 highway program "aimed at the solution of major traffic problems on main routes through and around cities and on sections of highways that will form part of the proposed interregional highway system." And this, as the PRA announcement made clear, will comprise "only part of the federal-aid highway construction and improvement program to be undertaken after the war."

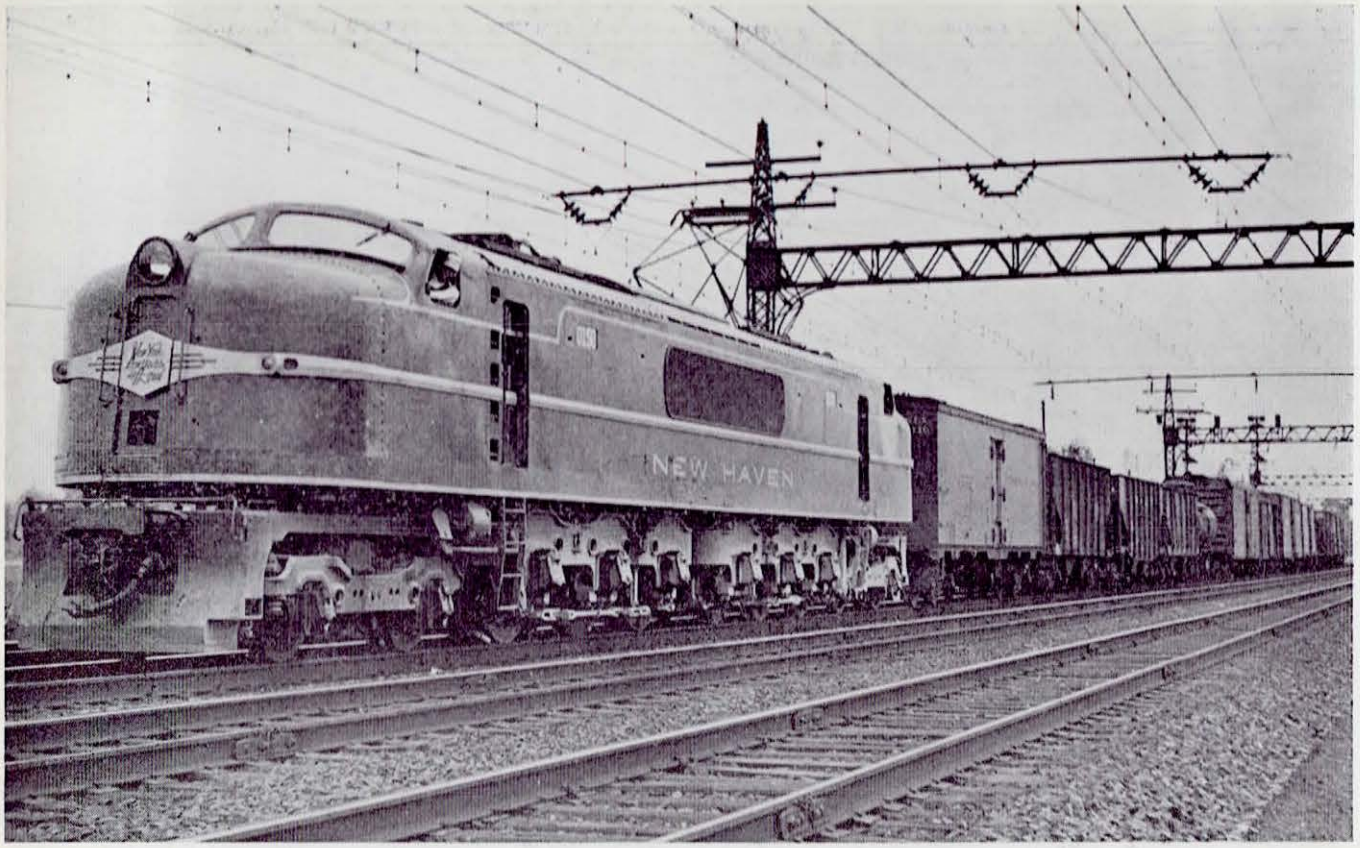
Generally, the Resources Board does not conceive its role to be one of actual planning, but rather that of stimulating planning on the part of "naturally interested" government agencies in various fields. President Roosevelt has called it "the planning arm of my Executive Office," which "at my direction is correlating plans and programs under consideration in many federal, state, and private organizations for post-war full employment, security, and building America." Thus the recent "Post-War Agenda" put out by the Board, as noted in the *Railway Age* of November 21, 1942, page 863.

The agenda, set up in outline form, lists the "Development of Transportation" among the "Improvements in Physical Facilities" which might be embraced in "General Plans for Public Activity." The objective with respect to transportation is stated to be "the modernization and integration of transportation facilities so as to provide economical service." Finally, the Board is expected to give further attention to transportation in forthcoming studies of industrial location and post-war reconversion of industry.

So it seems that there will be no lack of post-war plans for the railroad industry. It is therefore well advised in preparing to have a few of its own. Too often have the New Dealers been able to counteract sound criticism of their schemes with side-stepping replies of the "what would you do instead?" variety.

* * *

In the Reclamation Shops of the Southern Pacific at Sacramento, Calif.



Electrical Service Requirements

Programmed maintenance involving use of substitute materials is meeting emergency needs

By Alfred G. Oehler

Electrical Editor

GET more work out of it with less repair material and make it last longer. In some cases the railroads are meeting this requirement as applied to electrical apparatus and in many instances are conforming with it, in part. Equipment with excess capacity can be more heavily loaded (overloaded with discretion) and preventive maintenance can do much to extend life and reduce repairs. Simplification in manufacture has reduced costs and material requirements and some substitutes for strategic materials have been found to be as good as or better than those used originally.

Lighting

On November 1, 1942, the number of types of incandescent and fluorescent lamps produced by the manufacturers was reduced from 3,500 to 1,700 by W. P. B. simplification order, L-28-a. This worked some hardship on railroads using 75-watt car lighting lamps, since it eliminated that size, but it also effected improvements, in that it reduced the number of sizes required to be carried in stock and it definitely settled the question of 32- and 64-volt car lighting lamps by stopping their manufacture. The A. A. R. Electrical sections several years ago recommended that only 30- and 60-volt lamps be used since they allow light output to be the same when the train is running or standing.

There has been an extended use of lamps and lighting fixtures for protective lighting. Recommendations for this type of lighting, with particular reference to the lighting of bridges, are included in the report of the Committee on Illumination, Engineering Section, A. A. R., *Railway Age*, December 12, 1942, page 968. A special A. A. R. committee has also developed specifications and requirements for railroad blackout lighting.

Critical materials used for lighting fixtures have been replaced by substituting glass for aluminum reflectors, cast-iron for aluminum housing, all-glass for metal-glass units, pressboard for fluorescent fixtures, etc. Most of these must be looked upon as substitutes rather than permanent improvements.

A definite change in industrial lighting is in progress. While much of it is being held up by the war, it is evident that there will be a general shift from incan-

descent to fluorescent and high-intensity vapor lamps. In fact, the fluorescent lamp, which only four years ago was looked upon as an interesting source of colored light, is now being used by lighting engineers as the standard of comparison, a position held by the incandescent lamp for fifty years.

Power Distribution

In general, transformers are able to carry heavier loads than their nameplates specify. It should be remembered, however, that for each 14.4 degrees Fahrenheit the temperature of the transformer is increased the life of the transformer is halved. This does not mean that a little increase in load is going to have an appreciable effect on the life of a transformer; and to further increase their capacity means have been developed for forced oil cooling, forced air cooling, water-spray cooling and the use of sun shields or painting of transformers to reflect sun's rays.

Where the construction of outdoor substations becomes necessary, wood can be largely substituted for steel. Wood structures have the advantage of not needing painting as much as steel, and wood adds to the impulse strength of the station. The strength of wood is not as uniform as steel and a larger safety factor is needed. Warping presents some difficulties and wood does not look as good as steel, but care in design can avoid the usual temporary appearance of wood construction. No metal need be used other than standard pole line hardware. Steel pipe can sometimes be used for bus conductors.

Wire and cable, even for needed maintenance, is difficult to get and is frequently unobtainable. In many instances, overloaded circuits are being relieved by the use of capacitors.

The rubber situation has necessitated the development of other types of insulation. These include varnished cambric, varnished silk, varnished Nylon, Fiberglas and various types and forms of plastics. Most of these are better insulators and dissipate heat more effectively than rubber. They represent improvements, the use of which will probably be continued when rubber again becomes plentiful.

The scarcity of tin has created a solder problem. This has been met by using forms of solder which contain smaller amounts of tin or no tin at all. Probably the best substitute for wire and cable connections are the solderless wiring devices.

Shop Equipment

Railroad electrical men are recommending that the use of motors larger than necessary be discontinued. While ample size insures long motor life, it lowers power factor and increases loads on circuits, transformers and generators. Matching the motor more closely to the load may slightly reduce life and dependability, but these can be more than made up for by programmed maintenance. This includes scheduled inspection, cleaning, lubrication, insulation measurement, checking of clearances, dipping and baking. While all roads do not have adequate facilities for drying and baking, the introduction of near-infra-red drying has supplied a means which may prove superior to the older oven method. Improved slot and wire insulation has also added to motor insurance and permitted operation at higher temperatures. Recently produced heat-setting varnishes of the synthetic resin type have characteristics especially well suited to use with Class B insulation.

Improvements in welding electrodes are having their influence on electric welding. The new electrodes have extended the field of alternating-current welding and operators predict that a.c. will soon be suitable for all forms of welding. If this is true, it means that the a.c. welding transformer with lower maintenance and lower first cost, which could be further reduced with increased production, will offer increased competition to the rotating type machines.

Electric locomotives recently delivered to the New Haven, having a continuous rating of 4,860 horsepower, are capable of delivering a maximum horsepower of 9,000. These single-cab units, weighing 250 tons, can outperform three electric locomotives weighing a total of 350 tons, built in 1912. The Pennsylvania is adding to its fleet of type GG1 electric locomotives. Traffic on the Pennsylvania's electrified lines has reached a density which amply justifies the foresight of those who engineered the electrification. It seems improbable that this traffic could be handled by any other means.

Diesel-electric Locomotives

The dollar value of Diesel-electric locomotives ordered in 1942 was something more than $25,000,000. This brings the total railroad investment in Diesel-electric locomotives to about $187,000,000, of which about $75,000,000 is electrical equipment. This adds materially to the maintenance problem, which also includes the straight electric locomotives and multiple-unit cars in service on electrified lines.

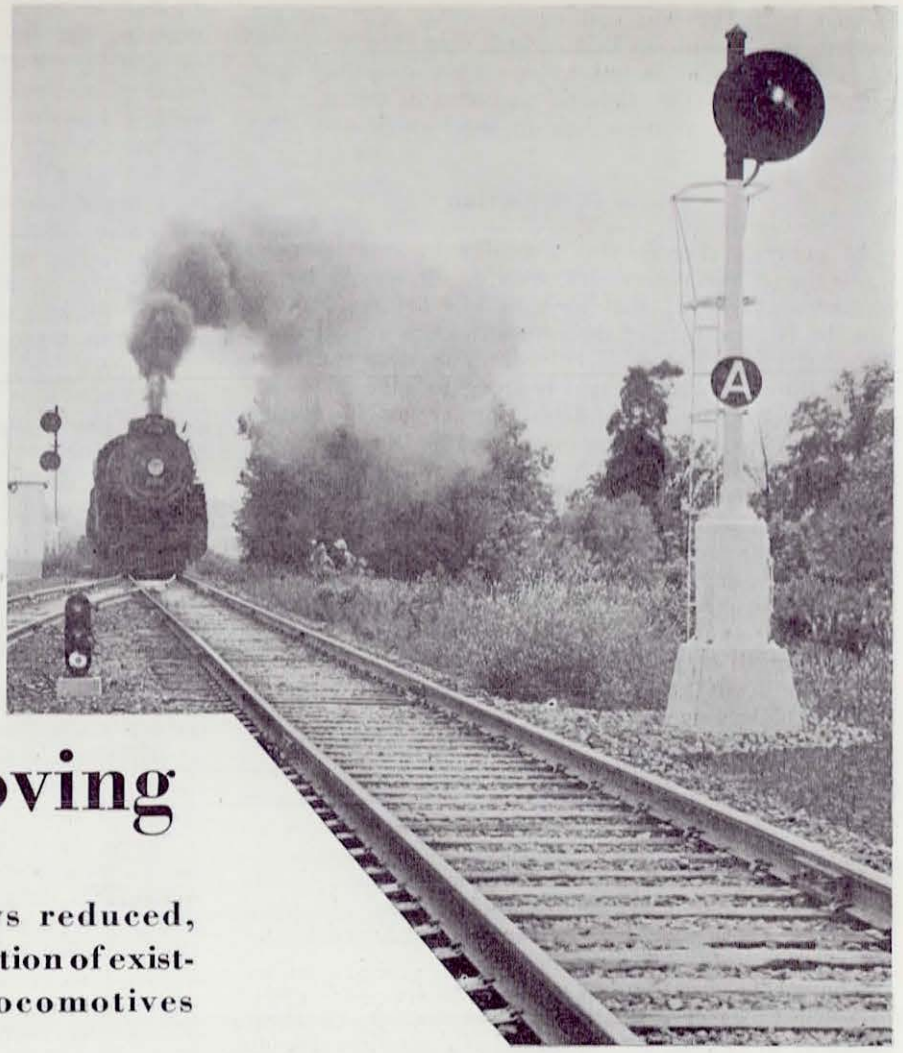
The situation is one which calls for careful planning, and manufacturers of Diesel-electric locomotives are suggesting that the railroads plan their maintenance a year ahead. At the request of the railroad, the manufacturer will ship immediately, motors, generators, turbo-chargers, fuel pumps and other replacement units for emergency replacements or scheduled overhaul. After the new unit has been installed, the one replaced is returned to the manufacturer, where it is reconditioned and held in stock ready for the next call. This reduces the amount of repair parts the railroad must carry in stock, but the railroads must take this service as a boost and not use it as a crutch. Much of the repair work must be done by the railroads even when it is done on a replacement basis, and the railroads will have to learn how to use new materials, such as the new insulation and substitutes such as tinless solder. Insofar as possible, it should be preventive maintenance, which is really careful inspection and testing which obviates the need for repair work.

No new air-conditioning equipment is being installed, but all air-conditioned cars are performing intensive service and every effort is being made to keep the equipment in good operating condition. This requires maintenance facilities similar to those needed for electric and Diesel-electric locomotives, plus Freon, means for maintaining the refrigerant lines, V-belts, flat belts, etc.

Outlook for Air Conditioning

The report on air conditioning, prepared by the Division of Equipment Research, assumes a 12½ per cent depreciation rate for air-conditioning equipment. While this may err on the conservative side, the life period is so short that manufacturers and railroads are now setting up post-war programs for replacing worn equipment on the 13,000 hard-used, air-conditioned cars. Post-war expansion programs are also on paper. To a considerable extent this will involve those 14,700 other passenger-carrying cars which are not air conditioned.

Centralized Traffic Control Increases Track Capacity and Saves at Least One Minute For Each Freight Train Mile



Signals Keep War Traffic Moving

Train stops and delays reduced, thereby increasing utilization of existing tracks, cars and locomotives

By J. H. Dunn

Associate Editor

THE year 1942 brought forth an abundance of evidence of the benefits of modern signaling facilities in increasing the amount of transportation which can be provided by existing cars, locomotives and tracks. As shown elsewhere in this issue, comparatively few sections of new main tracks were built last year, and the new locomotives and cars placed in service were inadequate to the needs.

Facing the necessity for expediting war materials, some roads have reduced train loadings to bring the speeds of trains as high as practicable; therefore, for the time being, little more can be accomplished in reducing overall train time or track capacity by increasing train speeds. Under these circumstances, signaling is proving an aid in keeping trains in motion a greater percentage of the overall time between terminals, and is increasing the capacity of existing tracks by reducing the spacing between following trains with safety, as well as directing trains to move as soon as an idle section of track is available. Furthermore, by reducing the time of trains on the road, locomotives are available for return trips more quickly, thus increasing the utilization of existing power.

With the exception of yard facilities and highway crossing protection, centralized traffic control represents a composite application of modern signaling, including automatic block, interlocking, and a means for authorizing train movements by signal indication without train orders. The automatic block signals permit following trains to be operated at the closest spacings consistent with safety. The interlocked power switch machines in a C. T. C. installation eliminate train stops and delays that would otherwise result from the use of hand-throw stands at these switches, so that a freight train can move out of a siding, over a section of track and into another siding in approximately 15 minutes less time. This time saving, in numerous instances, permits a train to be advanced one or more stations for meets with opposing trains. For a train that otherwise would be required to take siding for three meets, the time saved by C. T. C. on the first two meets may permit that train to arrive at its terminal before the departure of the third opposing train, thus obviating the delay which would have been occasioned by the third meet, as well as the running time between the meeting point and the end of the territory.

By means of the automatic train-graph and track-occupancy indications on the control machine, the man in charge is constantly informed of the location of and the progress being made by each train. Therefore, he knows whether it is possible to advance a train for a meet with another train, rather than holding it at the siding originally contemplated. Thus, with C. T. C., meeting points need not be established until the circumstances contributing to the most efficient operation are

known whereas, with other means of operation, these meeting points must be established by train orders which must be issued considerably ahead of the time when they are to be acted on, frequently without a means for changing orders fast enough to take advantage of changing conditions.

On some of the more extensive C. T. C. territories, where the passing tracks are one and a half to two times the length of a train, approximately 90 per cent of the meets are timed so closely that neither train is required to stop. Thus the waiting time on sidings is minimized. Through these various means the average overall time of freight trains on a busy division is reduced about 0.8 to 1.6 minutes for each train mile.

Examples of Results

As an illustration, after the installation of C. T. C. on a sub-division of more than 100 miles, the overall average train time was reduced 29 per cent, notwithstanding the fact that the number of trains increased 13 per cent and the number of cars increased 18 per cent over the previous period.

Centralized traffic control, including two passing-track switches in interlockings, and the remainder of the passing tracks equipped with spring mechanisms, was placed in service in January, 1942, on a 69-mile section of single track on another railway. Comparing operations during August, 1941, with those for August, 1942, an average of 8 minutes time was saved by each passenger train. The train schedules were not changed; therefore, savings in train time was effected only when scheduled trains were behind time or when extra trains were operated. One of the scheduled through freight trains reduced its time over this territory an average of 20 minutes on each trip. The average time of all westbound extra freight trains was reduced 22 minutes, and the average time of the local freight was reduced 3 hours, although the average time for eastbound extra freight trains increased 7 minutes.

An important factor in improved operation is the fact that, with C. T. C., trains can be accepted promptly when they are ready to go, and need not be planned so far in advance, whereas, when movements are authorized by train orders and restricted by time table, the orders must be established so far in advance of the actual planned departure that close dispatching is impossible. Extensive delays are then incurred by the issuance of new orders. In some instances, the traffic is now so heavy that, even with short districts, the dispatchers cannot issue orders fast enough under the train order system and, as a consequence, trains are delayed in yards waiting for orders when the main track is actually available for use. With C. T. C., the control of signals to authorize train movements is accomplished within a few seconds.

Increased Track Capacity

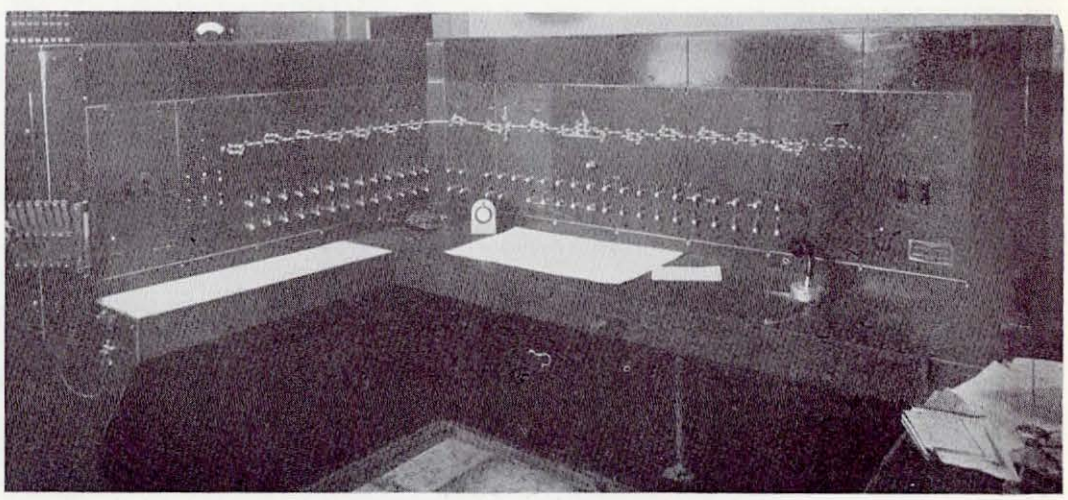
Two factors, overall train time and main track occupancy, determine track capacity. The C. T. C. facilities reduce the overall time, and reduce the occupancy time of sections of main track for each move of a train out of a siding, over a section of main track and into another siding. In the majority of instances, track capacity must be measured not in terms of the total number of trains operated in a 24-hour period, but rather by the ability to accept trains when they are ready to go and handle them promptly over a division during peak hours of any 24-hour period.

On a C. T. C. territory that includes 89 miles of single track, the traffic during past years ranged from 21 to 32 trains daily, but, with the addition of war business, the number of trains has risen from 45 to as high as 60. Yet an analysis of the train sheets for several days in October proves that these trains are being handled efficiently and without delays, and the operating officers agree that it is possible to move this increased traffic only by reason of the C. T. C.

On another 60 miles of single-track territory, where the normal traffic included 12 to 15 trains daily, the total suddenly increased to an average of 55 trains, with

C. T. C. Expedites War Shipments

Centralized traffic control is enabling as many as 60 trains to be handled daily on single track with no increases in overall train time as compared with the previous operations when 30 trains were being moved. Car retarder yards are now absorbing increases up to 3,500 cars classified over one hump daily without delays and in instances the average yard time of cars was reduced about 3 hours.



This C. T. C. Machine Controls 32 Power Switches and Signals at 16 Sidings And 1 Junction

peaks of 60 to 65 trains daily. Yet the C. T. C. permits each of these trains to move over the territory as quickly as with a normal volume of traffic. On still another railroad, a 30-mile section of C. T. C. on single track that normally handled about 35 trains daily has handled from 65 to 72 trains daily within recent months, which traffic is taxing the capacity of double-track sections extending in either direction from the C. T. C. territory.

On a centralized traffic control territory that includes 27 miles of double track and 75 miles of single track, the traffic in February, 1940, included 472 passenger trains and 859 freight trains. During February, 1941, the traffic on this territory increased to 473 passenger trains and 971 freight trains; in February, 1942, to 538 passenger and 1,585 freight trains, and in September, 1942, to 571 passenger and 1,811 freight trains. Yet the passenger trains are being handled on schedule and the freight traffic is being moved without delay.

A section of single track, about 22 miles long, handled 601 trains in August, 1940. Since that time, centralized traffic control has been installed, and in August, 1942, the traffic had increased to a total of 731 trains. In spite of this increase, the passenger trains were operated on schedule and each freight train saved an average of approximately 15 minutes. On a C. T. C. territory on another road the number of trains increased from 24.6 to 52.6 daily between February, 1933, and September, 1942, while on a second C. T. C. territory on the same road the number of trains increased from 44.3 to 95.3 trains daily.

Car Retarders Increase the Capacity of Classification Yards

About 23 miles of third track were removed when a certain C. T. C. project was installed in 1940. Although the number of train movements increased from an average of 48 daily in August, 1941, to an average of 56 in August, 1942, the remaining track capacity is adequate not only to handle this traffic without delay, but still more trains can be so handled.

C. T. C. Under Construction Now

Early in 1942, it became evident that the logical means for quickly increasing the track capacity of certain strategic sections of single track was to install C. T. C. Therefore, on territories where such facilities were under construction, projects were pushed to completion on a total of about 325 miles. In the meantime, the War Production Board co-operated in allocating materials for C. T. C. projects, which are now under construction or definitely scheduled, on more than 750 miles. Thus in the two war years, 1942 and 1943, the mileage of C. T. C. installed will total more than a third of the 2,703 track miles which had been so equipped in the 14 years prior to 1942.

Before releasing the necessary materials, the War Production Board has required a careful analysis of the need for C. T. C. as an immediate aid in war transportation, and if this need is not obvious, no priorities or allocations of materials are granted. Furthermore, the railroads are required to design the installations to use a minimum of strategic materials, such as copper line wires. Wooden instrument cases are used instead of steel ones. The lengths of insulated wires and cables are reduced to a minimum, and wire sizes, as well as the thickness of insulation, have been reduced according to recommendations of the Signal Section, A. A. R. Practices have been revised to permit much of the detail work, such as wiring, to be done in the factories or at construction headquarters rather than in the field. Travel time and work-train service are thus minimized and, as a result, well-planned projects which normally might require a year or more, are completed in a few months.

Freight Yard Operations Expedited

During World War I, congestion in many freight classification yards was the cause of serious delays. During the years since 1919, car retarders were developed and installed in more than 40 large freight yards. Two such projects was completed early in 1942, and with the co-operation of the War Production Board, another project was pushed to completion in October.

In a power-equipped classification yard the switch machines reduce the time required between cuts of cars for the operation of switches, while the retarders permit higher speeds when the cars are passing down the hump and through the yard switches, all of which enable a locomotive to push cars over the hump at a higher average speed. A time-distance interval must be allowed between cuts of cars to permit the operation of switches; therefore, the larger the number of cars per cut, the higher the average humping speed. By means of yard communication systems, the humpmaster can talk to the engineman and direct him to increase or decrease the speed, thereby taking advantage of each variation due to lengths of cuts.

A railroad which has four yards equipped with retarders finds that retarders permit a yard to be operated approximately 25 per cent faster than with manual braking. As an example, a train of 110 cars, with an average of 1.4 cars per cut, was classified in 23 minutes, or at the rate of 5.2 cars per minute with a humping speed of 2.6 m. p. h. Under different circumstances, as to the number of cars per cut and a smaller percentage of loads, the average speed might be increased to 3 m. p. h. or more.

An Aid During War

Viewed from the standpoint of aiding the war program, the benefits of car retarder yards are measured not merely by the total number of cars classified in any eight-hour period, but rather by the ability to classify all arriving trains promptly. This operation is practicable with retarders and power switches because only a few men are required, as compared with switchmen and car riders, a consideration that is especially important now on account of the scarcity of men.

One yard that is equipped with power switches and

retarders is operated only during the early morning, when inbound trains are classified to permit cars to be delivered promptly to industries and warehouses, and again during the late afternoon, when trains are made up for departure. In still another yard, the bulk of the eastbound merchandise and perishable freight, for local delivery and for connections, arrives during the early morning so that maximum yard operation is required for only a few hours. However, with power switches and retarders, men are available to keep the yard in service the full 24 hours, thereby classifying all trains soon after arrival and permitting through traffic to be dispatched without the delay which might be incurred if the yard were in operation only one or two tricks.

In spite of the fact that the traffic in many yards has increased from 30 to 100 per cent or more, the cars are being classified without delays. For example in one car retarder yard which normally handled about 29,530 cars each month, the average during recent months has increased to 62,140 cars. In another car retarder yard which classified an average of approximately 4,600 cars each week during 1930, the weekly average during May, 1942, was 15,792, and a freight train arrives at this yard at an average interval of 15 minutes. Although all of the cars are loaded, thus necessitating more time for classification, the speed of operation is such that a car passes over the hump every 38 seconds on the average throughout the 24 hours.

Car Retarders Enlarge Capacity

In a car retarder yard on still another road, an average of 21,000 cars handled monthly during 1937, was increased to 38,000 in August, 1942, without increasing the average time spent in the terminal. In another yard with retarder operation, the traffic increased from 40,868 cars in May, 1936, to 70,976 in May, 1942, and in this yard the average time between arrival and departure is two hours for manifest cars and about seven hours for empty cars or dead freight, such as coal. A yard, which handles loaded coal cars exclusively, classified an average of 1,794 cars per day during the first eight months of 1942, as compared with 1,246 cars daily during the same period of 1936, while reducing the average time of cars in this yard 3 hours 28 minutes.

Several years ago when power switches and retarders were installed in a certain yard, the superintendent estimated that they could handle up to 3,000 cars daily if the traffic ever reached that figure. During 1942, the traffic has increased to the extent that this yard is now handling an average of 3,500 cars daily, and all departures of road trains and to connections are being made on schedule. Even when certain trains arrive behind schedule, the speed of yard operation and the capacity available permit the cars to be classified in less than the time allotted, and connections are sometimes made in less than 30 minutes between arrival and departure.

A point of great importance is the fact that if the power switches and retarders had not been installed in the 40 important classification yards, it would not now be possible to employ enough capable switchmen and car riders to handle the traffic promptly. The result, therefore, would be congestion in yards, as in 1918, whereas today power switches and retarders are enabling cars to be moved through these large yards without delays. Thus the development and extensive installation of retarders has been a major signaling contribution to rail transportation in handling war-time traffic.

Construction in '42

(*Continued from page 22*)

so dire were the needs of the depression period, and so outstanding was the aid rendered by this equipment in that period, that many maintenance officers question whether they could have maintained their tracks without it.

With this experience as a background, the railways continued their purchases of work equipment beyond the depression years, expending more than $20,000,000 for approximately 13,500 units in the years 1937 to 1940, inclusive. With additional incentives in 1941, they further increased their purchases by at least another 8,000 units in that year, at an additional cost of approximately $10,500,000. This was the largest expansion in equipment that they had made in any one year up to that time, and brought their total investment in such equipment to more than $110,000,000.

With the onset of the war and the beginning of 1942, the need for still more equipment became apparent immediately, and, in spite of the determination of many maintenance officers to restrict purchases to the barest requirements in the interest of conserving materials vital to the direct war effort, most of them found their own war effort jeopardized so seriously by this policy that they were forced into the market. As a result, more roads purchased work equipment in 1942 than in any previous year, and the number of units and dollar value of such purchases nearly equalled those of the record year of 1941.

Much Additional Work Equipment Will Be Needed

The fact that such large purchases were made proved a boon to maintenance operations generally, as shortages in materials and increases in traffic called for more intensive maintenance, and as labor shortages increased progressively from month to month until they reached serious proportions late in the fall in many parts of the country. It is a foregone conclusion that large additional purchases of such equipment will be required in 1943 to effect replacements and to increase productive effort in the face of still heavier traffic, greater demands on the fixed properties, a continued shortage of materials, and a still more serious shortage of labor—all of which are anticipated.

Will the fixed properties of the railways be adequate to the war-time test to which they will be subjected in 1943? To this question in a year of national emergency, there can be but one answer—but that answer can be supplied only in terms of adequate materials, adequate man-hours and adequate equipment, the essential ingredients from which all elements of the fixed properties are made. This fact must never be lost sight of by railway officers and all others whose responsibility it is to see that the railways remain adequate to their tremendous war-time task.

"Wealth brings with it its own checks and balances. The basis of political economy is non-interference. The only safe rule is the self-adjusting meter of demand and supply. Do not legislate. Meddle, and you snap the sinews with your sumptuary laws. Give no bounties; make equal laws; secure life and property, and you need not give alms. Open the doors of opportunity to talent and virtue, and they will do themselves justice, and property will not be in bad hands."—EMERSON.

Proudly Fly the War Emblems That Testify to Achievement!

Large volumes of materials flow from production lines of railway supply industry as it makes good pledge to aid war effort

By Raymond A. Doster

Associate Editor

CONVERSION of the railway supply industry into a second war front has been completed and undreamed-of quantities of tanks, planes, guns, ships, shells, and other implements of war are now flowing from plants which normally produce the peacetime products of railway transportation. The change from peacetime manufacturing to war production during the period from 1939 to 1941 was miraculous in that the supply industry, in a few months, built and equipped new plants, converted old ones and successfully began the production of, in most instances, entirely different items.

However, the stepping-up of production and the participation in other activities associated with the war during the last year have been so outstanding that the railway supply industry has again won new laurels. Repeated governmental recognition has been made of "excellence in production," with the result that plants and employees of the railway supply industry have won every type of award of the Army, Navy and Maritime Commission as well as public acclaim. The emblems of awards possessed by the plants and employees of the railway supply industry include the Navy "E" burgee for "excellence in production," the Army-Navy "E" burgee for "high achievement in the production of war equipment," individual Army-Navy lapel pins, the Maritime "M" burgee and the Victory Fleet Flag for "outstanding achievement," the Navy Ordnance pennant and the Maritime labor merit insignia for employees.

Public recognition of achievements of plants and employees of the railway supply industry has been reflected in the participation of many communities in ceremonies celebrating the presentation of awards. In several instances whole towns have honored the occasion by calling recesses in daily routine to enable all citizens to attend ceremonies and by declaring Army-Navy Days which featured the plants' accomplishments and sponsored civilian war activities.

The Supply Industry in Combat

The contribution of the railway supply industry to our war effort is not confined to the enlistment of its plants. The talents of its officers and employees are an outstanding factor in the development of new methods of production and materials while their adaptability enables them to undertake new tasks. In addition, the industry is fostering enlistments in the armed services, is aiding in the sale of war bonds and is utilizing substitutions in an effort to save vital materials.

The glory won by the railway supply industry is not without foundation for behind its performance is the engineering and production acumen of the officers and employees who have made possible the conversion of peacetime operations to wartime production. In a matter of months, old plants have been converted or restored, new plants built, machinery and tools secured from all sorts of places, special purpose machinery and tools designed and built, expert workmen sought and found, and employees trained to unfamiliar tasks. Even before conversion was completed, war materials had begun to flow from production lines. At the same time, these railway supply companies have stepped up their production of railway materials and devices and have met the requirements of the railroads to the extent that they have been able to secure the materials required therefor. All in all, it has been a spectacular performance.

The diversity of war products being made, differing

As Canadian Commandos Returned to British Soil After the Dieppe Raid on August 19, Caterpillar Tractors Aided in Unloading Heavy Armored Vehicles from Barges and Lighters. Photo by British Combine Photos, Ltd.

markedly from those of peacetime, reflect the ability of the industry to transpose itself into a new role. Combat tanks, armor plate, shell forgings, fuses, bridge pontoons, demolition bombs, and mine sweepers, for example, are being made by the American Car & Foundry Company; combat tanks, gun carriages, shells, Diesel engines and other items by the American Locomotive Company; combat tanks, railway and antiaircraft gun mounts, gun barrels, barbettes, shell forgings, armor plate, projectiles, battleship turrets, marine Diesel engines, ship keels, propellers and metal and plastic parts for airplanes, steering gears for ships, airplane elevators for aircraft carriers and catapults for airplanes by the Baldwin Locomotive Works; fragmentation bombs, shells, airplane parts, doors, oil and gasoline tanks, stacks, manhole covers, and other items for naval vessels by the Edward G. Budd Manufacturing Company; and combat tanks, gun carriages, trench mortars, shells, bombs, parts for anti-aircraft gun mounts, wings for cargo airplanes and submarine patrol boats by the Pullman-Standard Car Manufacturing Company; and combat tanks and crawlers by Lima Locomotive Works, Inc. Besides these implements of war, supply companies are producing a variety of other items that are used in modern warfare.

Production Will Be Greater

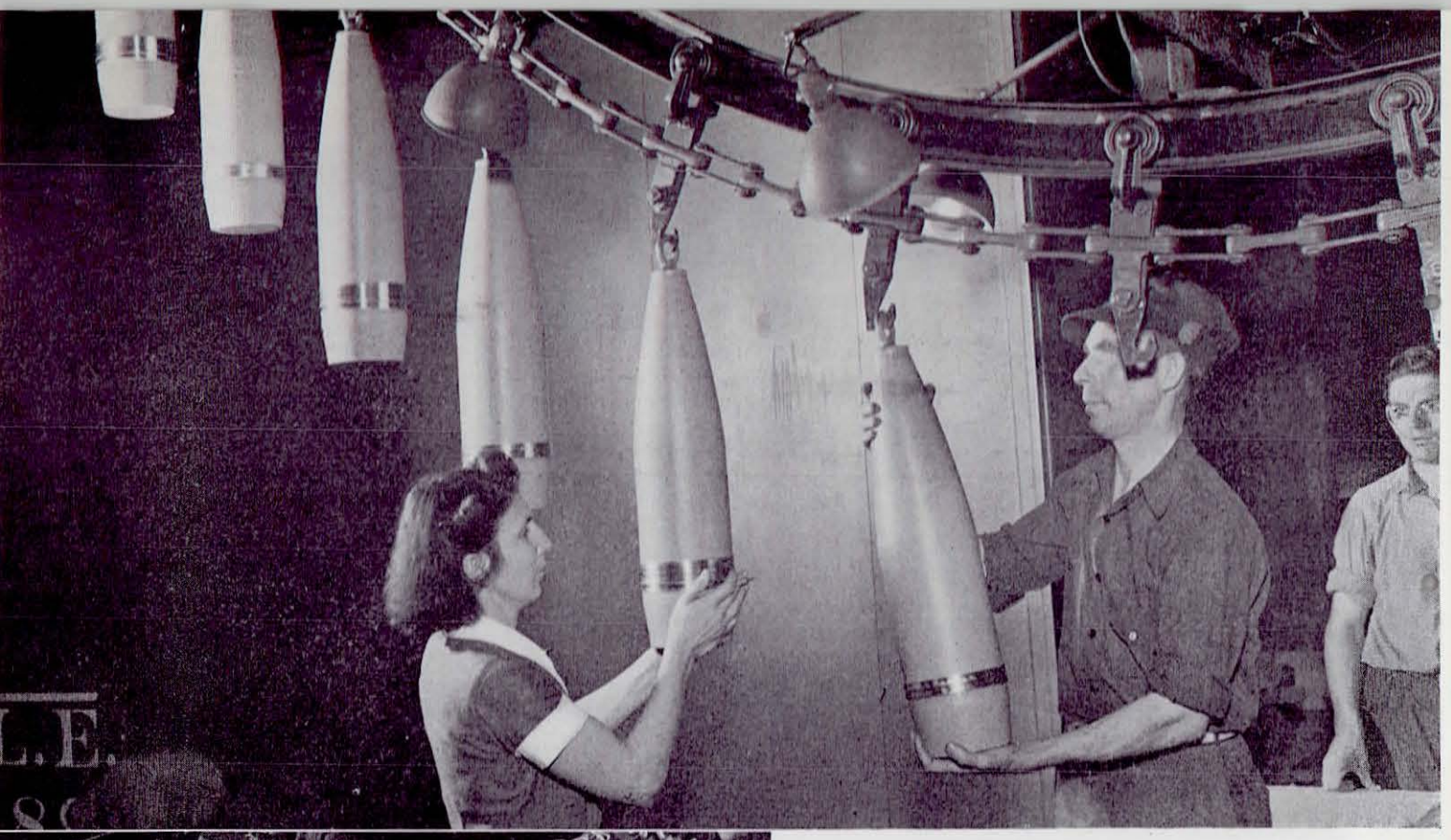
A year ago, about two billion dollars of prime and sub-contracts for war materials had been placed with railway supply companies since 1939 by the Quartermaster Corps, the Air Corps, the Navy and Ordnance department. During the last year the total has been increased materially and as a consequence, output will reach new heights during the coming months. Indicative of the rate at which production has been increased and will be stepped up in the months ahead is a comparison of the contracts awarded the Pullman-Standard Car Manufacturing Company prior to December 7, 1941, and since, as a result of which this company now has to make eight times as many tanks, six times as many gun carriages and mortars, twelve times as many airplane parts, two and one-half times as many shells and bombs, and four times as many anti-aircraft welds. In addition it is now producing submarine patrol vessels, the first of which will soon be launched, and is building a number of military freight cars.

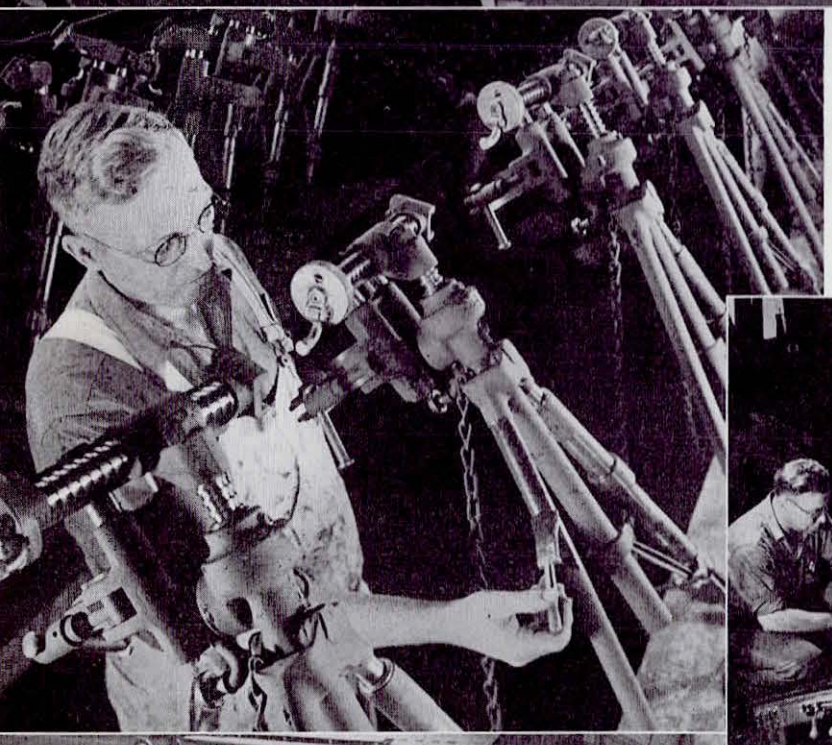
Similarly, the Edward G. Budd Manufacturing Company and the Budd Wheel Company have increased their combined output from $69,240,000 in 1940 to $119,223,000 in 1941 and to $162,000,000 in 1942, and at the present time it appears that their production in 1943 will increase to still higher levels. Likewise, the Lima Locomotive Works, Inc., has just completed an extension to its tank arsenal at Lima, Ohio, and when it is in full production the company will be producing five times as many tanks as were contemplated when the original tank plant was built in 1941.

Supply Companies Contribute Men and Talents

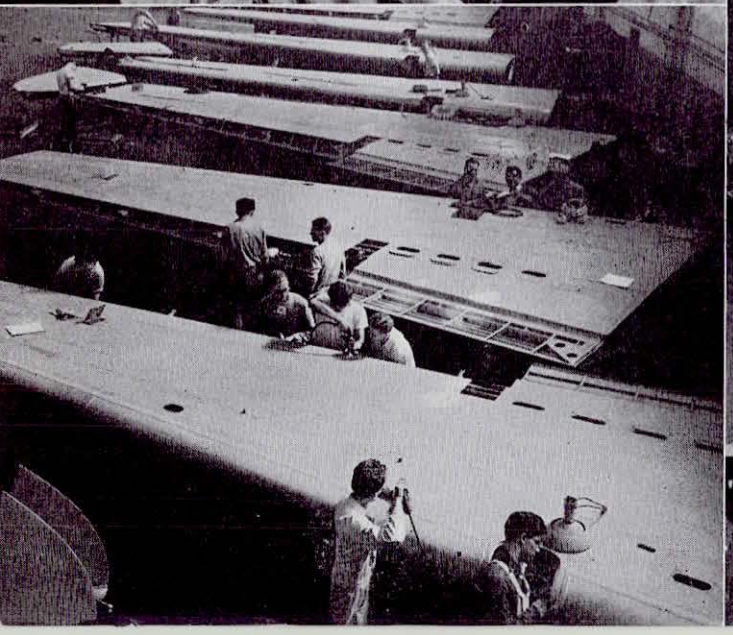
The contribution of the railway supply industry has not been limited to the production of implements of war for they have encouraged their employees to enlist in the armed forces, have sponsored the sale of war bonds and have donated their talents in the development of new methods of fabrication and design and the discovery of substitute materials which conserve the supply of vital substances. The American Locomotive Company, in 1942, upon the suggestion of the Corps of Engineers of the Army, sponsored the 762nd Engineer Railway Diesel Shop battalion of the U. S. Army and encouraged its personnel from all phases of its operations, including clerical help, to enlist in order to insure a complete unit that would be familiar with every aspect of Diesel locomotive maintenance. Included in the enlistments from American's plants are senior officer Major William Rogers, formerly a district service engineer, Captain George F. McGowen, formerly a survey engineer and

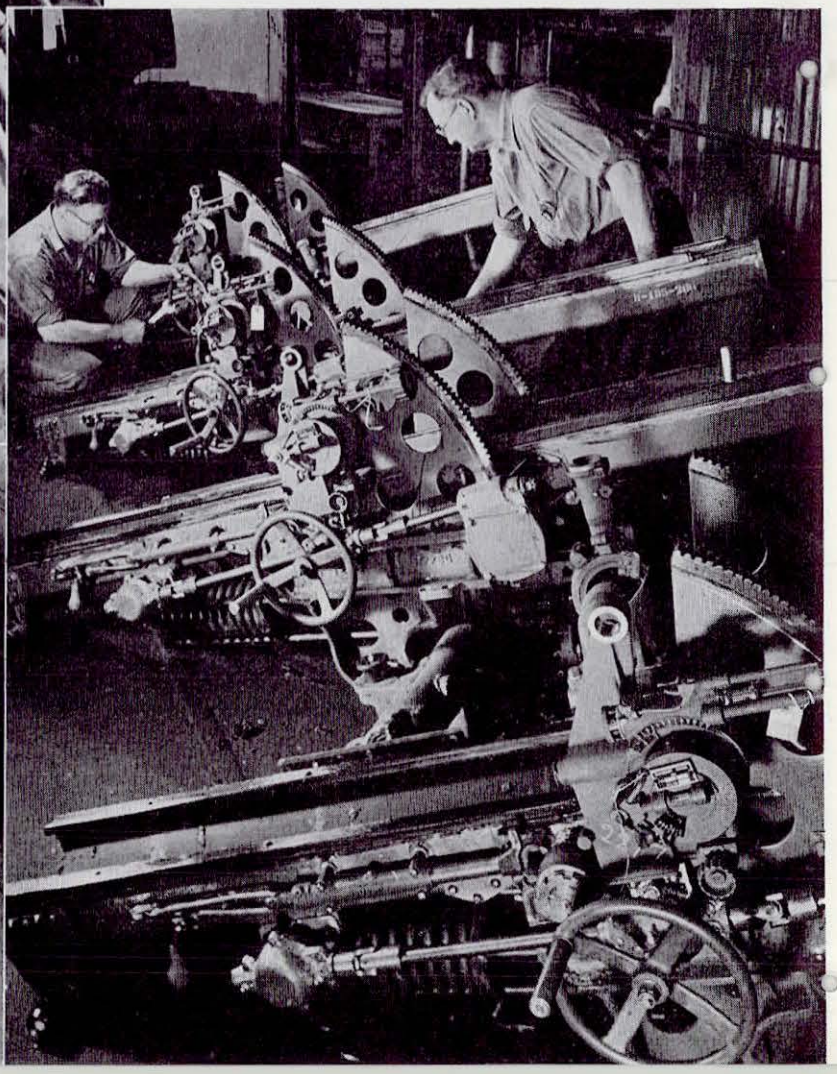
Brawn and Brains of Officers and Employees Win Recognition. The Commonwealth Plant of the General Steel Castings Corporation at Granite City, Ill., Is Presented with the Army-Navy Burgee





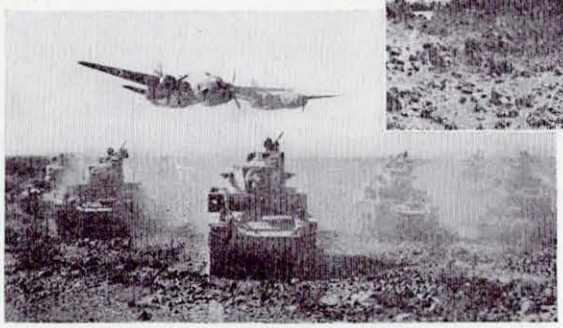
As Many As 20 Different Items Are Being Produced by a Single Company. Shells, Mortars, Plane Wings and Gun Carriages Are Among the Eight Products Made by the Pullman-Standard Car Manufacturing Company





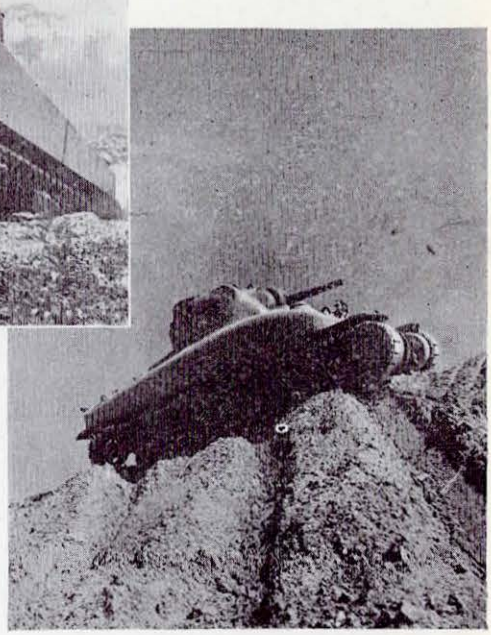
Combat Tanks Are Assembled by the Locomotive and Car Builders from Many Parts Made by Other Railroad Supply Companies

A Large Tank Built by the American Locomotive Company Passes Its Test



Air and Armored Forces Flex Their Military Muscles on the Deserts of California, using Tanks Built by the American Car & Foundry Co. Photo by U. S. Army Signal Corps

A Mighty M-4 Turned Out by Lima Locomotive Works, Inc. Is Ready for Action

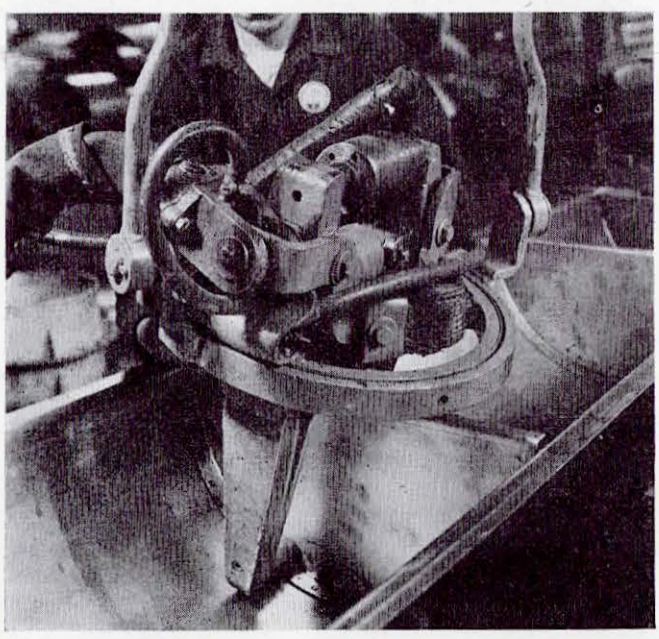


Lieutenants Charles C. Davis, John D. Coleman, Myron A. Tenney and W. E. Sagstetter, formerly Diesel service engineers. Specialists in phases of Diesel engine maintenance were also drawn from the General Electric Company, the Westinghouse Air Brake Company and the Electric Storage Battery Company.

The Caterpillar Tractor Company also has sponsored a Corps of Engineers heavy shop company, composed chiefly of skilled men from the company's Peoria, Ill., plant. In command of the shop company, which consists of 199 officers and men, is Captain Jean Walker, formerly export representative for Caterpillar.

In addition, many companies have paid tribute to enlisted employees by special dedications and ceremonies. The J. G. Brill Company, on July 8, held an Army rally and dedication for employees in the armed forces, at which a plaque containing the honor roll of 200 names was unveiled by a mother whose three sons' names were on the plaque and whose husband is employed in the Brill plant.

The supply companies have also encouraged enlistments and their contribution to the armed forces includes a large number of men. The service flag of Pullman-Standard includes 2,000 stars; that of the General Electric Company, 5,000; and that of the Nordberg Manufacturing Company, 200.



A Special Welding Gun Has Been Designed by the Edward G. Budd Manufacturing Co. to Speed Up the Fabrication of Parts for Naval Vessels

Employees Contribute Brawn and Brain

Employees of railway supply companies are not only contributing hours of toil but are giving their ideas for efficient operations and are functioning well on labor-management committees. Pullman-Standard employees contributed several thousand suggestions during the last 18 months, of which the 2,000 adopted have markedly helped production and conserved materials. At the same time these employees have saved manpower by supporting a safety program for the reduction of accidents. The success of their efforts can be measured by the fact that compensation costs for this company are only 20 cents per $100 of pay roll, compared with an average of $1.40 per $100 of pay rolls for the automobile industry and 50 cents for the automobile manufacturer with the lowest compensation cost.

Employees of the Caterpillar Tractor Company, likewise, have made many suggestions relating to such subjects as saving machine operations, saving materials, reducing scrap, prolonging tool life, adding to working safety and saving production time. A worker in one plant suggested an apparatus which reduced the time needed to test a war weapon from 10 working days to one hour. Since the Army required 1,100 of these weapons, there was a saving of nine days and seven hours in

testing each one, or a total of 10,862 days. On the basis of an average working year of 300 days, this one suggestion saves 36 years of work.

In many instances, the employees of railway supply companies have exceeded the 10 per cent-of-pay-roll goal set by the Treasury department in its war bond drive. The purchases of some employees have been spectacular.

New Materials and Methods Developed

Probably the greatest contribution of employees and companies has been the development of new materials and methods of fabrication. The forge division of the American Brake Shoe & Foundry Company, as an illustration, has pioneered in the production of shell forgings by the "upset" method and as a result the steel saved in its two plants in two years is sufficient to build 800 medium tanks. The American Welding Company, a subsidiary of the American Car & Foundry Company, which is engaged in hammer and pressure welding operations, received the Army-Navy "E" award for its accomplishments in the production of gas containers for the Chemical Warfare Service of the United States Army. The Railway Service & Supply Corporation has developed a freight car journal bearing which conserves copper and tin and which it has offered to license to manufacturers of journal bearings at a nominal royalty of $1 per year, so that all of the railroads may use it for the duration of the war.

The construction of ships by the Pullman-Standard Car Manufacturing Company not only reflects the ingenuity of the railway supply industry in developing new methods of production but is an example of the ability of the industry to undertake new enterprises. Under a flow method of production, this company is constructing naval patrol vessels in sections so that the 14 which comprise the ship are completed in consecutive order and can be lowered by crane into place on the ways. Benefiting by years of experience in the construction of all-welded freight cars, passenger cars and streamlined trains, in which standardization was accomplished by building sides, ends and roofs in jigs or forms, the company adapted a system of jigs to its shipbuilding program. Each of the 14 sections is assembled in a separate jig which is mounted on wheels that roll on a wide gage track. As each section is completed, it is lifted from its jig by an overhead crane and moved on a standard gage underslung freight car to the launching ways four miles away. The building ways accommodate 12 vessels at one time.

Vital Materials Saved

Typical of companies saving vital materials is the Caterpillar Tractor Company which, during 1942, saved more than 2,300,000 lb. of strategic materials, including 250 tons of nickel, 700 tons of copper, 100 tons of aluminum, 50 tons of chromium, 40 tons of crude rubber, and 55,000 lb. of tin, based on 1941 production levels. By substituting induction-hardened steel for nickel and nickel-chromium steels, this company has reduced its annual consumption of nickel from 450 tons in 1941 to 200 tons in 1942, although the consumption in 1942 would have been 600 tons on the basis of 1941. In one design of tractor alone, 50 tons of nickel per year went into the final drive gears prior to 1942, while today, these gears are made of induction-hardened carbon steel which have no appreciable nickel content. In addition, a new air-blast method of quenching now makes it possible to use plain carbon steel instead of chrome-vanadium steel in tractor sprocket hubs and steering clutch flanges; also, carbon-manganese steel has replaced carbon-chromium steel in crankshafts, effecting a saving of vital chromium.

Fairmont Railway Motors, Inc., is another of the many companies which have replaced vital materials with other substances. In its rail motor cars, about 95 per cent of all aluminum has been replaced, effecting a saving of approximately 167 lb. of this material on each motor car. Plastics also are being used.

R. G. LeTourneau, Inc., has cut down the crude rubber content of the tires employed on its Carryall scrapers, which will effect a saving of 500,000 lb. of rubber a year. In the case of its 18-by-24 tires, approximately 60 lb. of rubber is being saved in the casing, 7 lb. in the tube and 3 lb. in the flap.

The efforts to save materials being made by the electrical manufacturers is typified by the work of the General Electric Company to minimize the use of one hundred or more materials which have been designated as vital for war purposes. These include aluminum, chromium, copper, magnesium, nickel, tin, tungsten, formaldehyde, shellac, mica and rubber. About 175 tons of aluminum and 100 tons of tin are being saved a year.

Contribute Scrap

Still another way in which the railway supply companies have contributed to the war effort is by the collection of scrap. An extra 5,000,000 lb. of metal, rubber and other war-needed materials, for example, were salvaged during July, August and September in an intensive scrap drive by all divisions of the Westinghouse Electric & Manufacturing Company in addition to routine collections made regularly. The drive started with an office clean-up week collecting rubber ink-wells, metal paper weights and metal gadgets, which produced enough scrap to build eight army tanks but it soon extended beyond the offices. Several freight cars, an abandoned transformer tank, five miles of an old telephone line and old electric motors were donated while almost five tons of high-quality steel tools were released from work benches. One division turned in 300,000 lb. of metal parts and another enough metal to build thirty-five 3,000-kw. generators.

Operation as an Arsenal Creates a Vast Enterprise

The operation of the railway supply industry as an arsenal of democracy is no small enterprise. The plants of Pullman-Standard, for example, are only a part of a gigantic net work. Its plants are fed by 960 sub-contractors, ranging from a one-man shop to an industry of 150,000 workers, located in 170 cities in 20 states. These sub-contractors hold 5,490 Pullman-Standard contracts. The finished products of these sub-contractors move on exacting schedules over a net work of railroads to Pullman plants where they are incorporated into the final products. From these plants the weapons of war then move over railroads to points of embarkation on their way to the front.

Although the railway supply industry's participation in the war has been voluntary, financial and other conditions restricting the expansion of their facilities have necessitated government aid and intervention. For example, when the government realized that the existing facilities of the American Steel Foundries for fabricating cast-steel armor could not produce the amount needed, it, through the Defense Plant Corporation, furnished $26,500,000 for the construction, at East Chicago, Ind., of one of the largest steel foundries in the country

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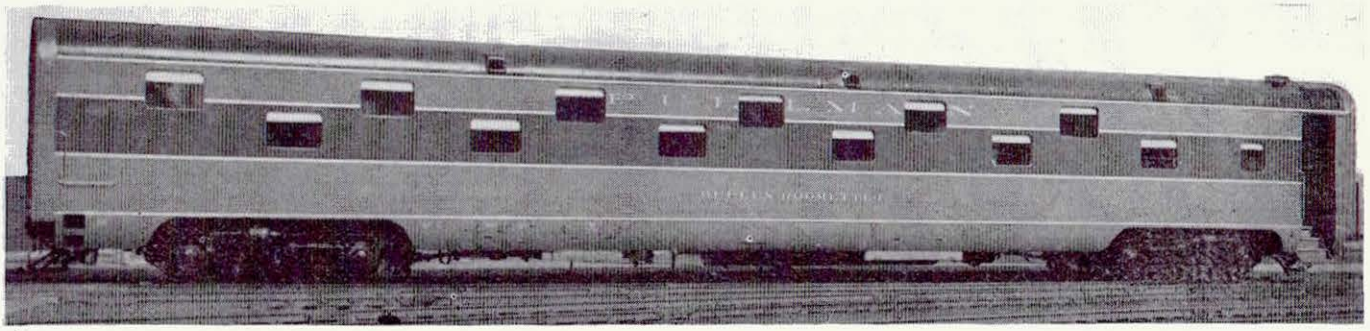


New Pullman Duplex Roomette Car Placed in Service in 1942

Few Passenger Car Improvements Were Made in 1942

A limited number of new cars installed and some conversions made—Prospects for the coming year point to further intensive use and no added new equipment

By E. L. Woodward

Western Mechanical Editor

ASK the average railway mechanical officer, and particularly the head of the car department, what was done to improve passenger cars on his railroad in 1942 and he will say, "Practically nothing." If asked about the prospects for 1943, his reply will be, "Even less is contemplated." This does not mean that ordinary repair work and the maintenance of safe mechanical conditions were overlooked during the last year. It does not mean that no new cars were added, or that no conversion and improvement work was done in either builders' or local railroad shops. By and large, however, the new cars installed and those equipped with improvements chargeable to additions and betterments in 1942 were a relatively insignificant part of the present railroad passenger-car inventory.

The reasons for this apparent lack of consideration for passenger train equipment, in a time when passenger traffic is near record-breaking proportions and about one-third fewer cars are available for handling this traffic than there were 20 years ago, are not hard to discover. They include, first, primary emphasis on the movement of freight traffic and war goods and, second, difficulty in getting the necessary priority rating, allocation and actual delivery of critical materials, particularly steels, required in building passenger cars. Lack of shop space and labor shortage also would doubtless have precluded any substantial passenger car-building program in 1942 had the other factors been favorable.

Some indication of official opinion about railroad needs or lack of need for additional passenger equipment is afforded by what happened in the case of a small number of new cars, probably less than 100, which were in various stages of completion in the shops of several car builders when the order freezing all new construction went into effect last April. These cars are still uncompleted although, in some instances practically all necessary structural materials were on the ground at the time of the freezing order, already fabricated and generally unsuitable for other use. It cannot be questioned that the completion and placing of even these few cars in service, would have helped one or more railroads out of a tight situation in meeting peak passenger traffic requirements.

Why New Passenger Cars Are Not Being Ordered

The fact that neither the Association of American Railroads nor the Office of Defense Transportation is asking, and the War Production Board is not authorizing, any new passenger cars for delivery in the first eight months of 1943 must be attributed to a general conviction: (1) that there is still considerable slack in the use of railway passenger equipment; (2) that no appreciable increase in passenger traffic is anticipated; or (3) that if there is an increase in rail travel of military personnel and civilians engaged in war work, other civilian passenger traffic must be curtailed in proportion.

The first consideration may be largely discounted, as it is generally known that the railroads had to operate their passenger equipment at near maximum capacity during the greater part of 1942 and this capacity was seriously overstretched in spots by the recent record movement over the year-end holidays. As regards the second point, no authoritative forecast of passenger traffic in 1943 has been advanced, but the intensified war effort and increased movement of lend-lease goods is expected to increase freight traffic at least 15 per cent. A proportionate increase in passenger traffic, directly or indirectly associated with war production, would seem to be indicated. National gasoline rationing will ap-

parently divert more and more traffic to the rails as time goes on and this movement includes the transportation of a substantial number of war workers. The facts cited point to the probable need for more passenger equipment than is apparently in sight for the railroads in 1943.

New Equipment Proves Its Worth

New passenger equipment not only appeals to the traveling public, but proves a great help in handling heavy passenger business due to the added capacity and also to the fact that new cars generally are highly reliable and require little mechanical attention for a considerable period after being placed in service, hence contributing to intensive utilization and high monthly mileage. Modern high-speed passenger train equipment, installed on railroads in the last few years, has demonstrated its worth and the relatively small amount of new equipment placed in service in 1942 has given more than its proportionate increase in serviceability and income-earning capacity.

Of the 513 new passenger cars reported on order as of January 1, 1942, 316 were railroad cars and 197 Pullman sleeping cars, all but 40 of the latter being completed and assigned to service as follows: 78 to the Overland trains of the Southern Pacific-Union Pacific-Chicago & North Western; 24 to the Golden State trains of the Chicago, Rock Island & Pacific-Southern Pacific; 20 to the Panama Limited of the Illinois Central; 4 to the Erie; 4 to the Missouri Pacific; 26 to the Atchison, Topeka & Santa Fe; and 1 new-type duplex-roomette car which has given exceptionally satisfactory results in test service on the Pennsylvania, the New York Central and the Baltimore & Ohio. In fact, many more sleeping cars of this new type would doubtless have been built except for war conditions, as its popularity results in twice the former rate of occupancy of conventional Pullman sleepers. The car is notably easy riding and, in the first seven months of operation, accumulated about 220,000 miles, with the loss of only three days service while being transferred from one assignment to another.

Of the 316 railroad cars on order the first of last January, 70 cars were built by the Pullman-Standard Car Manufacturing Company and included 68 baggage, baggage-mail and chair cars for the Union Pacific and two diners for the Illinois Central; the American Car and Foundry Company delivered 20 new coaches to the Chesapeake & Ohio; the Pressed Steel Car Company built the last 25 cars of an order for 98 coaches which the New York Central divided between Pullman-Standard, American Car and Foundry, and Pressed Steel; the Pacific Railway Equipment Company delivered three new pendulum-type cars, one each to the Santa Fe, the Great Northern and the Chicago, Burlington & Quincy; a considerable number of special troop-carrying cars was either built new or reconstructed from older equipment, but information about the exact number and type of design utilized in these cars has not yet been released for publication; some so-called luxury cars and other types have been converted to coaches and thus contributed to increased passenger-carrying capacity.

Principal Features of Some of the New Cars

By far the most unique design of railroad passenger car, developed recently and tested thoroughly for the first time under actual operating conditions during 1942, was the pendulum-type car mentioned. As described in some detail in the *Railway Age* issue of January 24, 1942, the body of this car is, in effect, suspended above the center of gravity, being supported on large, soft-acting coil springs, recessed into the car structure at each of the four corners and bearing on the truck frames about where the bolsters would normally be. The length and flexibility of these springs is such as to permit all lateral and turning movements of the trucks in normal service without the usual center plate and flexibly supported truck bolster design. With vertical and lateral oscillations suitably dampened, an unusually easy-riding car is secured and, in taking curves at above superelevation speeds, the car body tips inward slightly, instead of outward, thus effectively adding to the sense of stability and riding comfort within the car.

The three pendulum-type coaches, delivered to the Santa Fe, the Great Northern and the Burlington, were first operated and tested together as a three-car unit early in 1942, on each of the roads, the thought being that the maximum pendulum effect would be observed in the center car, unrestricted by being coupled between conventional cars. No report of formal test results has been released. The cars were subsequently delivered to the respective individual owning railroads where they are now giving generally satisfactory service.

The 20 C. & O. coaches built by the American Car and Foundry Company, are notable for simplicity of interior design and for their large seating capacity. The coupled length is 80½ ft. and each car is designed to accommodate 80 passengers in two compartments in comfortable, rotating, double reclining-back seats. The car frame combines a riveted and welded girder design, being made of open-hearth carbon steel. The lightweight of the car body is 91,840 lb. and the two six-wheel trucks weigh 47,820 lb., making total weight about 70 tons.

Long Life, Easier Maintenance

In the 25 N. Y. C. coaches, built by Pressed Steel, particular pains were taken to secure colorful and attractive interior equipment and a distinctive decorative treatment, but the construction details are also of interest and of course far more important from the point of view of long service life and freedom from maintenance difficulties. The cars are constructed primarily of U. S. S. Cor-Ten steel, it being found necessary, however, to use substitutes for many details which increased the weight over that of the proposed original design. The girder-type side frame embodies riveted construction, but the underframe, including center sills, bolsters, cross bearers and combined platform and center sill castings are fabricated by welding. Each coach has a vestibule at one end only. The car length, over coupler pulling faces, is just under 85 ft. and the total weight 133,200 lb. Owing to the provision of a commodious men's room in one end of the car and a women's room in the other end, the main passenger compartment is restricted to a length of 54 ft. 7 in. and 28 double reclining-back seats give a total seating capacity of 56.

Typical of the work done by a considerable number of railroads in their own shops in 1942 to take care of increasing passenger business was the carefully developed program of the Canadian Pacific, for example, which not only built some new coaches, but converted compartment sleepers into cafe-sleepers with 12 diner seats in addition to one double bedroom and six regular sections; compartment sleepers into cafe-parlor, diner, 8-section, 4-double-bedroom cars; recreation cars, formerly used on de luxe through trains, into bedroom-compartment cars with a lounge section and buffet space.

The Chicago & North Western converted about half its ownership of conventional parlor and cafe-lounge cars into passenger coaches, materials used in the recon-

ditioning of these cars being for the most part salvaged from retired equipment or from replacement stocks already on hand. The urgent need for increased passenger carrying-capacity is also shown by the steps some railroads have taken to buy up almost any steel cars available and recondition them for passenger service, also, in some instances, converting old combination cars, smokers, drover cars and shop train equipment into coaches, which can be used in all except first-class through trains. Some consideration has even been given to "unmoderning" certain passenger coaches, which simply means reducing the generous seat spacing recently considered essential and substituting a seating arrangement which will provide for 20 or 30 more passengers per car. In general, relatively few passenger cars are now in shop being overhauled and the few in bad order are repaired as quickly as possible and returned to service.

Early last year, a suggestion was advanced that troop movements in this country be handled in 50-ft. coaches of special design which would be built in quantities for the government and, at the close of the war, sold to the railroads for conversion into freight equipment. No information has been released regarding further development of this proposal. Some modern railroad box cars have been converted into troop-carrying cars and the same is true of certain Pullman equipment, but details regarding the number of cars involved and the conversion work done on them are not available for publication. One statement recently authorized is to the effect that seven million troops were moved in Pullman sleeping cars during 1942, not including soldiers, sailors and marines traveling on furloughs, or individual assignments.

A certain amount of passenger car research work, sponsored by the A. A. R., individual railroads, car builders, supply companies and the Pullman Company, was carried on during last year. The present status of the truck research program, initiated in 1935 and now being conducted by the New York Central, the Pennsylvania, the Pullman Company and the Chrysler Corporation, was described in the *Railway Age* of September 26, 1942. Other promising truck developments are being pushed. One of the largest fields for further improvement in passenger car construction lies in the use of substitute materials, the advantages and limitations of which, based on physical characteristics, are for the first time being brought out in the war-time use of these materials. Just what effect the continued prohibition of the construction of new passenger cars will have on the car building industry is problematical. As long as builders' shop forces are kept intact on war work and their shop equipment maintained in good working condition, it should not be difficult to swing back into car construction, if and when necessary.

Emblems of Achievement

(*Continued from page 36*)

and facilitated the work so that the plant was completed on October 26, or in less than a year from the time when architects and engineers were instructed to prepare plans.

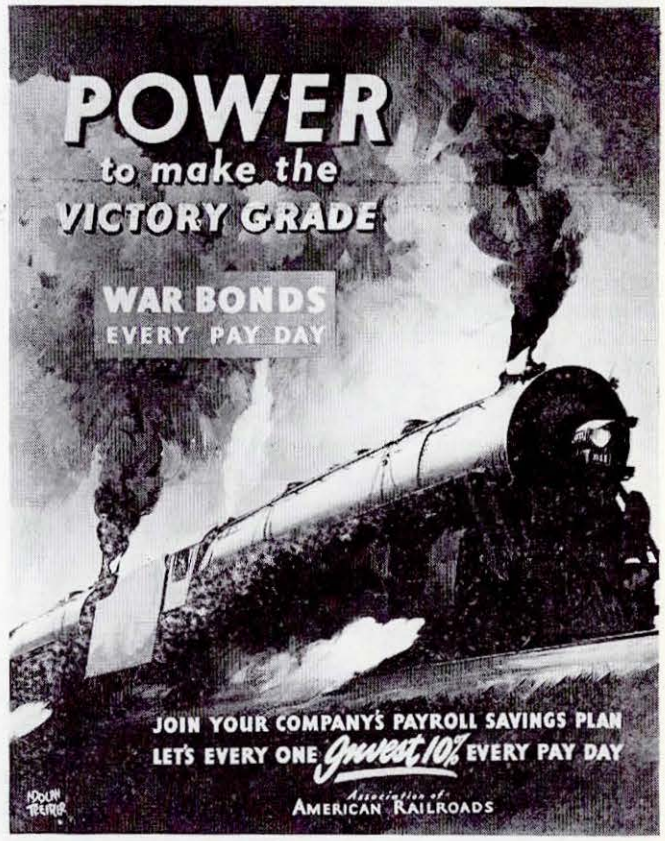
The General Steel Castings Corporation affords another example of much the same situation. This company, which pioneered the design and construction of cast-steel tank hulls, built its first plant for heat treating armor castings in 1940 and followed it with a second for heat treating and finishing these castings in 1941. The construction of these plants was financed by the company. It will go into production early this year in a complete new armor foundry, the construction of which has been financed by the Defense Plant Corporation.

In some instances the government has ordered companies to construct plants at government expense or has practically commandeered plants.

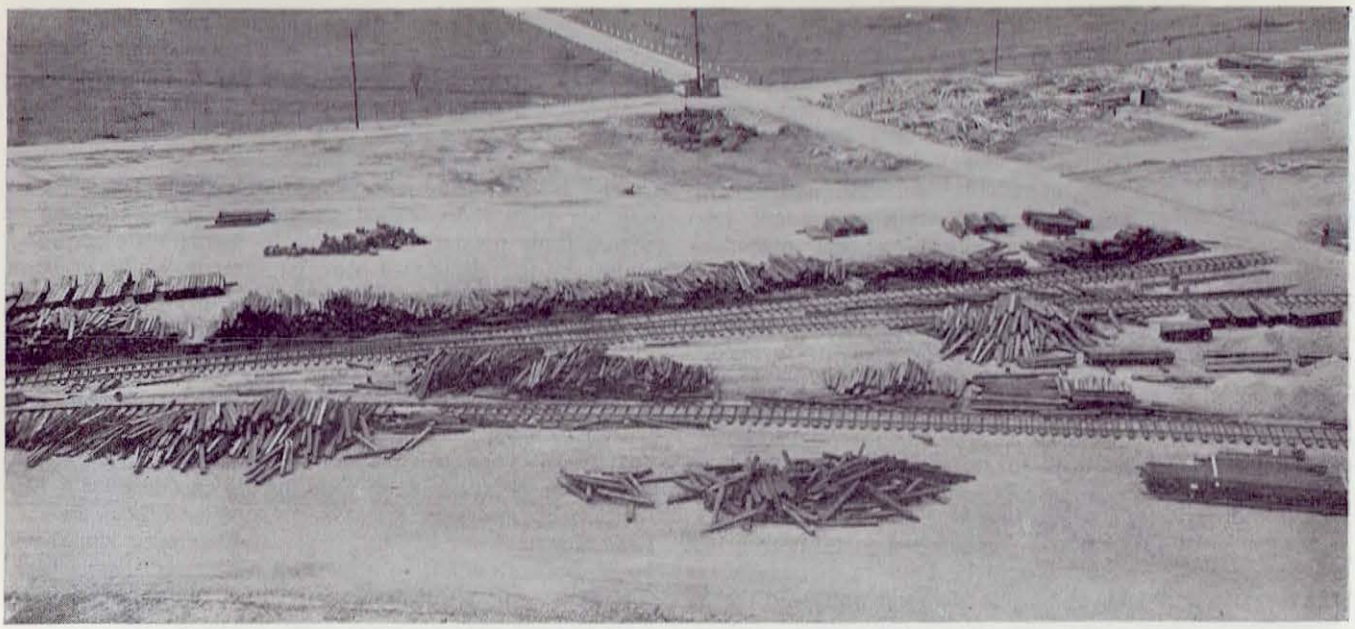
The task of producing war materials is not an easy one for plants are called upon from time to time to adjust their production set-ups to incorporate improvements in the design of war equipment while in some cases plants have been directed to abandon the manufacture of one product and begin the making of an entirely different one. It is, therefore, necessary for these companies to preserve a flexibility that will enable them to shift with the needs of modern war. The Baldwin Locomotive Works, for example, was called upon, in the latter part of the year, to revamp its facilities so that it could shift from products of a building era to those of a production era. Its Southwark division had been making hydraulic presses, bending rolls and piercing presses in large quantities, but in a short time, converted its plant for the manufacture of steering gears for ships, airplane elevators for aircraft carriers and catapults for airplanes. Likewise, its tank production was changed to include the manufacture of several types of tanks.

In aiding our war efforts, the railway supply industry has not only converted its plants but has contributed its talents as well to the development of our war machine. It has developed new materials in an effort to conserve vital ones; has devised new methods of producing war products and in other ways has facilitated production. In addition, it has encouraged enlistments in the armed forces and has fostered the sale of war bonds. The awards it has won proudly testify to its achievements.

* * *



War Bond Poster Being Distributed by the A. A. R. to Cooperate with the Treasury Department in Promoting the Sale of War Bonds to Railroaders



These Track Materials Were Accumulated At a War Establishment for a Large Yard Extension

War Plants Need Much Trackage

Upwards of 8,000 miles were built for all types of defense projects during 1942, using relay rail furnished largely by the railroads under L-88

By M. H. Dick

Eastern Engineering Editor

WHEREVER a new facility is built for equipping, supplying or housing the armed forces of the United States, some railroad trackage is required for the purpose of tying that facility into the nation's transportation system and making it an effective functioning unit in the war effort. Depending upon the type and size of the particular installation, the amount of trackage required at individual locations ranges from a fraction of a mile to 100 miles or more, and when it is realized that our war effort has involved the construction or enlargement of literally thousands of such establishments, it is immediately evident that the provision of railroad trackage has constituted an important phase of the program.

For various reasons, it is of absorbing interest to review the railroad trackage requirements of the war-construction program. In the first place, the amount of such trackage that it has been necessary to build is an index of a form of railroad construction activity that has latterly overshadowed all others. Further than that, however, it is another, and little publicized, measure of the railroads' contribution to the war effort, for they have furnished practically all of the rail that has gone into this trackage that was built during the last year.

War construction in preparation for the present conflict had its beginnings in 1940 with the inauguration of the national "defense" program, steadily gathered momentum through 1941, and then climbed steeply to a new peak of activity in the year just closed. Following this pattern of development, the construction of railroad trackage at war establishments in 1942 likewise reached a new high level, and was several times as great as for the two previous years combined. However, unlike the "pre-Pearl Harbor" era, the construction of war facilities during 1942 was carried on behind a curtain of secrecy that can be lifted only to permit a general discussion of the extent of trackage requirements of the year.

Late in 1941 (before Pearl Harbor) it was estimated that the total trackage requirements of the defense program, as projected at that time, would amount to about 2,500 miles, of which approximately 2,000 miles had been completed. However, this figure did not long hold, for at the turn of the year a vast enlargement of the war program was projected, predicated on our entry into the conflict as an active belligerent. As a result, it is estimated that at least 8,000 miles of tracks have been built at war establishments of all types during the last year. Because of various factors in the situation that have made it difficult to arrive at an exact estimate, this figure has been held to the conservative side, and for this reason it is not unlikely that it is a considerable understatement.

Because nearly every type of construction project undertaken in connection with the war effort involves the

building of railroad trackage, any discussion that seeks to give an idea of the amount required will, as an incidental feature, involve the presentation of a general cross-section, as to types of projects, of the construction program as a whole. If these types are lumped together, without regard to the manner in which they are carried out, or by what agency, they will include army camps and cantonments; ordnance and munitions plants and storage depots; quartermaster and general supply depots; holding and reconsignment points; plants for manufacturing aircraft, tanks, guns and a wide diversity of other equipment and materials; shipbuilding yards for both combat and cargo vessels; arsenals and proving grounds; and air fields.

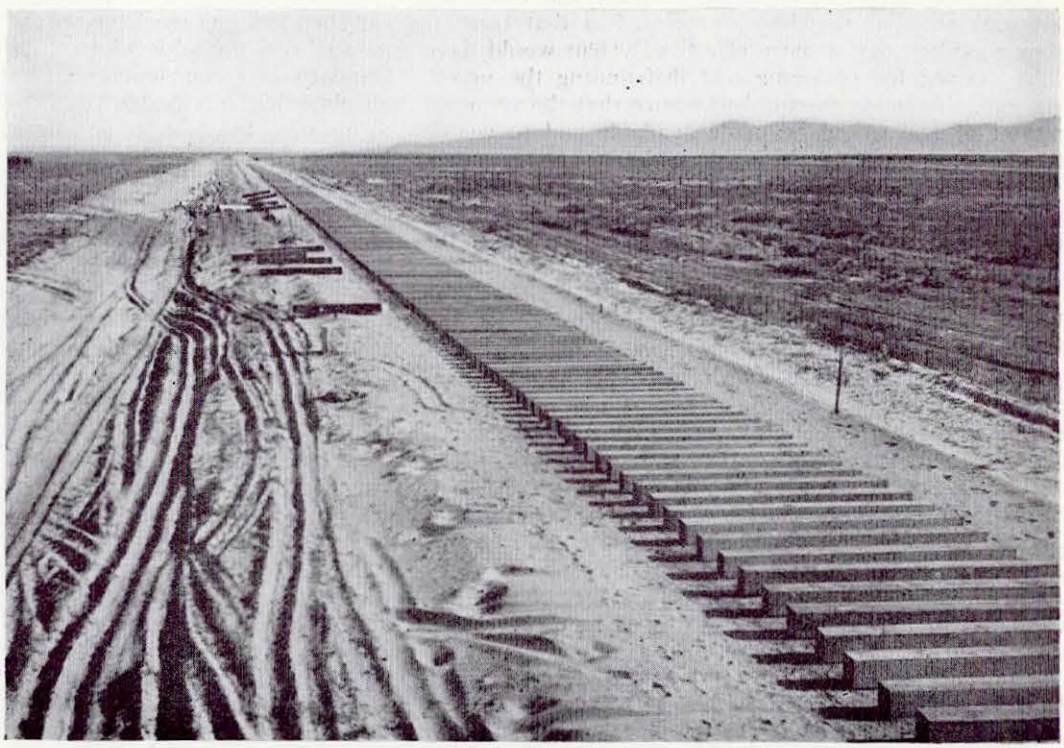
The great majority of the projects in these categories are, of course, being carried out either directly by governmental agencies or with the aid of government funds, and, because control of these projects is centralized at Washington, it has been possible to obtain over-all figures giving the amount of trackage involved. However, in many instances projects involving the construction or expansion of plants for making supplies and equipment for the armed forces are carried out by private concerns with their own funds, and there is no way of determining with accuracy the trackage needs of such plants. Then there are the hundreds of miles of tracks, in the form of spurs, side tracks, yard tracks, and additional main tracks, that the railroads themselves have found it necessary to build to handle wartime traffic. In this category, comprising a special type of facility that has required a large amount of trackage, are the many ground-storage yards that have been constructed.

By far the largest single phase of the wartime construction program is that of the War Department. During the first two years of the defense program, practically all construction for the army, except of airfields which were built by the Corps of Engineers, was prosecuted by the Construction division, Office of the Quartermaster General. However, effective on December 16, 1941, all construction activities of the army were consolidated under the direction of the Chief of Engineers. Included in the army's phase of the construction program are such facilities as the various types of training and housing centers; munitions plants, such as bomb and shell-loading establishments; ordnance and quartermaster supply depots; plants for manufacturing chemicals and explosives; arsenals and proving grounds; and holding and reconsignment points.

Practically all projects in these categories, whether they have involved the construction of new facilities or the expansion of existing establishments, have required the laying of at least some trackage—some of them very substantial amounts. As a class, it is the ordnance and munitions plants that, speaking generally, require the largest amounts of trackage at individual locations. At the end of 1941, it was estimated that a total of more than 1,000 miles of tracks had been built at such plants, and that all other undertakings of the Quartermaster department, including training centers, supply depots, arsenals and the like, had required the building of about 500 miles of tracks. In view of the great expansion in the construction program since these figures were compiled, it is apparent that they have now become substantially larger. In fact, figures furnished by the Office of the Chief of Engineers indicate that, during the period between October 1, 1941, and November 30, 1942, approximately 1,970 miles of trackage were completed on all projects under the jurisdiction of that office. Moreover, a considerable amount of additional mileage was under construction at other projects in various stages of completion. For the first half of 1943 it is estimated that sufficient rail will be needed to build more than 700 miles of tracks at army projects.

Trackage at D. P. C. Projects

Among the construction projects directly related to the war effort are those financed by the Defense Plant Corporation, a subsidiary of the Reconstruction Finance Corporation. Through agreement with existing private concerns, government funds are made available by this agency for the construction and enlargement of plants for making a wide variety of materials and equipment needed in prosecuting the war, such as synthetic rubber,



Spur Tracks of Considerable Length Were Frequently Necessary to Connect War Plants with Nearby Railroads

magnesium, aluminum, chemicals, steel, arms and explosives, cargo vessels, etc. A year ago it was estimated that a total of about 350 individual projects, involving an expenditure of approximately $2,000,000,000, had been undertaken with funds furnished by the D. P. C.; this has now increased to about 1,600 projects, requiring an expenditure of nearly $9,000,000,000, of which about 500 have been completed.

About 75 per cent of these projects require the construction of new facilities (the remainder entailing only the acquisition of machinery), and at most of these at least some railroad trackage is required. In fact, among them are a number of large industrial plants, costing $100,000,000 or more, requiring very substantial mileages. It is estimated that the total amount of trackage that was constructed during 1942 in connection with projects of this type was well in excess of 500 miles, and that in 1943 the requirements will be more than 250 miles. A point to remember is that many additional projects requiring railroad trackage have been undertaken by commercial concerns using private funds, for which estimates are not available, although it is believed that the trackage required has been substantial.

Contrary to what might be expected, shore establishments built by the Navy Department have involved the construction of a large amount of trackage. As in the case of the War department, figures for the calendar year 1942 are not available, but an indication of the mileage required is given by the fact that about 1,300 miles of tracks were built at Navy projects between April 20 and November 30.

Forces Control of Used Rail

During the early stages of the construction program, it was generally the practice to employ new rail and fastenings in the construction of trackage at defense establishments. However, as the requirements for rail grew with the steady enlargement of the construction program, it became the practice more and more to utilize relay rail obtained either from the railroads direct or from dealers, and in obtaining such rail the user agencies operated more or less independently of each other. Early in 1942, in view of the vast increase in the war construction program that was being projected at that time, it became evident that a more effective system would have to be devised for obtaining and distributing the necessary rail, this being essential to insure that the required amount of rail would be made available and to enable its distribution to be brought under proper control. Through such control it was believed that sufficient relay rail could be obtained to satisfy the demands of the war-construction program, thereby freeing all new rail for use by the railroads.

Accordingly, effective on April 22, 1942, the War Production Board assumed control over all used rail and rail joints. This was done through the agency of Limitation Order L-88, which had two general provisions, namely, (1) it stipulated that any railroad receiving new replacement rail must, in turn, make available to the WPB certain amounts of used rail, delivered in accordance with a specified schedule; and (2) it prohibited the sale or transfer of used rail of all grades without authorization from the Director of Industry Operations of the WPB. The schedule for returning used rail, expressed in terms of percentages of the total lineal feet of new rail received, was as follows: 15 per cent within 30 days of the receipt of a consignment of new rail; 15 per cent within 60 days; 20 per cent within 90 days; and 40 per cent within 150 days. Thus, an amount of used rail equivalent in lineal feet to 90 per cent of the new rail received was required to be returned.

Incidentally, it is estimated that up to the present time the railroads have returned approximately 50 per cent more used rail than they were obligated to deliver under the terms of L-88.

How the Railroads Responded

A measure of the manner in which the railroads have responded to this order was provided by figures submitted recently by Major E. T. Butler, representing the Army and Navy Munitions Board, in testimony before a Senate committee investigating the requisitioning of railroad lines. According to Major Butler, 60,715,000 lin. ft. of used rail, equivalent to nearly 6,000 miles of track, had been received from the railroads between January 1, 1942, and September 30. During the same period, 16,600,000 lin. ft. was received from suppliers other than railroads, and another 6,865,000 lin. ft. was obtained from requisitioned lines up to September 1. Thus, in the nine months ending September 30, about 84,180,000 lin. ft. of used rail, equivalent to approximately 8,000 miles of track, had been obtained for assignment to the armed forces and defense industries.

Other figures presented by Major Butler show how the used rail made available by the railroads and others has been divided between the various user agencies, thereby comprising another measure of their trackage requirements. Between April 22 and November 30, a total of 29,190,301 lin. ft. of rail (about 2,700 miles of track) was assigned for use at Army projects; 12,749,885 lin. ft. (about 1,200 miles of track) went for Navy undertakings; 3,630,977 lin. ft. (about 340 miles of track) was assigned for use at projects of the Maritime Commission; and 26,005,920 lin. ft. (about 2,500 miles of track) was turned over for use at projects of the Defense Plant Corporation and others. It should be pointed out that the figures given here are not necessarily an exact indication of the actual mileages of tracks built, for in some instances the rail has been used for other purposes, such as skidways and crane runways.

Standards of Construction

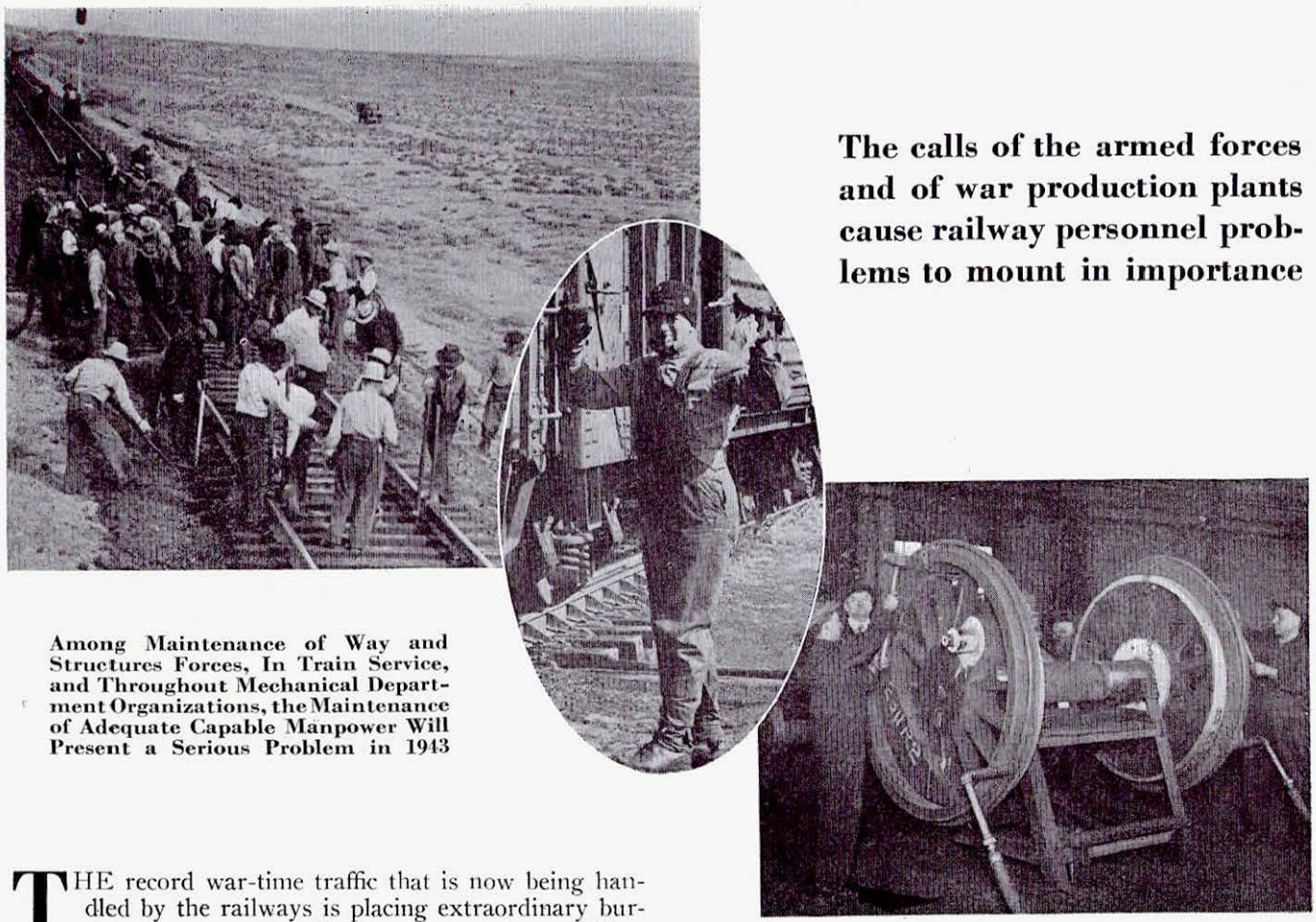
When building trackage at war establishments in 1942, it was not the objective to adhere to any particular standard of construction, but rather to place emphasis on obtaining serviceable tracks when and where needed, using such available materials as would permit this to be done in a reasonably satisfactory manner.

Since, in accordance with the provisions of Limitation Order L-88, used rail returned by the railroads must be accompanied by the joint bars, these presented no particular problem. However, some difficulty was encountered in obtaining the needed quantities of track bolts, nuts and spikes, which had to be acquired new, and to satisfy at least part of the requirements for these items, special arrangements were made for manufacturing them. Generally speaking, tie plates were not used in trackage built at war plants in 1942, except on some curves and through turnouts. The requirements for switches and frogs, at least on Army and Navy projects, were satisfied largely by having 10,000 complete No. 8 turnouts built, using new rails.

In retrospect, the building of upwards of 8,000 miles of tracks at war establishments in 1942, was, in itself, an outstanding accomplishment, but when consideration is given to the fact that this feat was performed during a period of great material shortages, it becomes an achievement of the highest order. To the railroads must go much of the credit for making it possible.

Manpower—Scarcer All the Time

The calls of the armed forces and of war production plants cause railway personnel problems to mount in importance



Among Maintenance of Way and Structures Forces, In Train Service, and Throughout Mechanical Department Organizations, the Maintenance of Adequate Capable Manpower Will Present a Serious Problem in 1943

THE record war-time traffic that is now being handled by the railways is placing extraordinary burdens on every part of the transportation machine, and especially on its personnel. Co-incident with this peak load, selective service, voluntary enlistments and the competition of war industries are taking thousands of men from the ranks of the railroads. As a result, in every department, the railways are facing a problem of serious proportions and one that, if not solved, may jeopardize their contribution to the war effort.

A survey of railroad labor conditions made by the Division of Transport Personnel of the Office of Defense Transportation disclosed that on September 15 there were 60,000 unfilled jobs on 101 Class I railroads. In announcing this figure on November 15, Otto S. Beyer, director of the Division of Transport Personnel, explained that this does not mean that there were actually 60,000 vacancies that could not be filled, for it includes the normal turnover of employees, which, in itself, accounts for a substantial number of vacancies on any given day, but, he added, it does "reveal a real and critical shortage of railroad labor."

So serious had the problem become by late October, especially on the western roads, that Joseph B. Eastman, director of the Office of Defense Transportation, brought the matter to the attention of the War Manpower Commission, asking what possibilities of relief there might be in sight through measures under its control or jurisdiction. The question was also taken up with the selective service headquarters, and, as a result, during the week of November 9, telegrams were sent to the directors of selective service in western states requesting that they take the situation into consideration and exercise caution in drafting railroad men.

This acute situation on the Pacific Coast lines is particularly evident in the maintenance of way department, where attempts to get laborers from the east have been fruitless and the importation of Mexican labor has been blocked, at least temporarily, by the railway labor unions. All departments are vitally affected, despite the fact that much money has been spent and separate departments set up for the sole purpose of recruiting labor. The seriousness of the situation is exemplified on the Pacific Lines of the Southern Pacific, for example, where 10,000 men are needed. Other roads serving the Coast are relatively as short of men. The situation is growing more serious daily and is now out of the hands of the railways, who have exhausted every expedient to get men. A marked slowing-up of important traffic in a most critical territory is imminent unless some relief can be furnished at once.

There are a number of conditions that have brought about this labor situation on the railways. More than one road has more than 5,000 former employees in the armed forces alone and the effect of this is bound to be felt on even the largest system. Moreover, many railway employees have been attracted to war industries because of higher pay. In addition, the railways have supplied the Military Railway Service with several thou-

sand of their best men. The effect of this is illustrated on one large road, where, foreseeing the present eventuality, the management embarked upon an all-out labor recruiting campaign immediately after Pearl Harbor and, in the year that followed, succeeded in hiring 7,500 new men. The net gain in employees for the year, however, was less than 3,200 men, the armed forces and war industries having taken more than half of the gain affected during the year.

Shortage in All Branches of Service

The shortage exists in all branches of the service, but the railways are keenly aware of the danger and every one of them has embarked upon some sort of program for recruiting and training new men. Retention of the men they have has been rendered difficult by the fact that there is a considerable lack of uniformity in the practices of local draft boards in applying selective service rules. To overcome this and to create confidence among the boards that deferment is being asked for only when necessary, several expedients were adopted. One Class I railroad with a relatively short mileage authorizes no one but the president of the railway to ask for deferments or deal with the draft boards. Another line has made it a definite policy to find 3-A men to replace all employees called and asks for deferment only when absolutely necessary. In the final analysis, though, the needs of the armed forces have come first on all the railways. The point is rapidly being reached, however, where something will have to be done to stop the drain of manpower or the efficiency of the nation's transportation machine will be seriously threatened.

So far as losing men to the army or war industries is concerned, the operating department has suffered relatively few losses in train and engine service, as compared with other classes of employees in that or other departments. In general, a big majority of the conductors and enginemen are beyond the draft age and this is true of regular firemen and brakemen as well. Switching service crews have, as a rule, been somewhat harder hit. This does not mean, by any means, that the manpower problem in train and engine service is solved, for the extra boards have been drained of younger men. Also, the heavy traffic has created a far greater proportionate demand for these employees than in other departments. It is possible to handle more trains with the same shop force or section organizations, but more trains necessarily call for more train and enginemen, particularly since the efficient use of the manpower available is strictly limited by the provisions of the contracts with the brotherhoods.

Manpower in the Operating Department

The chief problem arises in getting the additional men necessary to serve as brakemen and firemen and, to do this, the railways are called upon to enter a highly competitive labor market where the supply is getting scarcer every day. Fortunately, on most roads, the traffic is great enough so that these younger men can be guaranteed steady employment at fairly high rates of pay. However, the supply is not inexhaustible, and the railways are fortunate in having brought their operations to such a high degree of efficiency that it is necessary to operate fewer trains today to handle the same traffic than were necessary during the last war. The obvious answer to the problem is, of course, the amelioration of "make-work" rules that are curtailing the effectiveness of available manpower. Many of these rules were never justified economically and, in time of war, with a scarcity of manpower, they border on sabotage of the war effort.

One of the places where the manpower shortage is felt especially keenly is in telegraphers and, to a lesser extent, because of the fewer number involved, in dispatchers. Several of the lines foresaw that this problem would have to be met and established telegraph schools. These schools are producing trained operators now who are relieving the shortage, but the problem of finding men to attend these schools in the first place is becoming acute and, in many instances, women are being substituted and have proved satisfactory in the somewhat limited scope of jobs they can handle in this field.

Freighthouses are sufficiently busy to place a premium on freighthouse labor. However, the restriction of the manufacture of civilian goods and the heavier loading of cars of l. c. l. freight under O. D. T. order No. 1 have resulted in reducing freighthouse work below what it would have been proportionately under normal conditions. Many other minor operating department positions are difficult to fill. There is even a shortage of manpower to serve as crossing watchmen and several railways are employing women for this purpose.

The operating department manpower problem is assuming increasingly serious proportions. Already, there have been instances of trains of important freight delayed several hours waiting for crews. The managements have exhausted every effort to bring the manpower up to where it should be. The ability to solve this vexing problem whose solution is vital to the nation's welfare is in the power of the brotherhoods. The decision whether the nation's freight and passenger trains are to be moved efficiently rests with them.

Maintenance Forces Face Serious Problem

This problem is equally serious in the maintenance of way and structures department in most parts of the country, and in the total number of unfilled jobs, looms larger than in any of the other departments. Furthermore, while there is an easing of the situation generally during the present winter months, except for emergency labor to handle snow about large terminals, as work programs in many parts of the country necessarily slow down, the prospects that adequate labor will be available next spring to carry forward essential track, bridge, building, water service and signal maintenance, is distinctly unfavorable in most sections of the country.

As early as March, 1941, reports of losses in various classes of maintenance labor were being heard, with difficulty of securing suitable replacements, and since that time the situation has become progressively worse, especially in certain general sections of the country, and otherwise generally in the larger cities and in the neighborhood of war industries, ordnance plants and shipbuilding yards. As of September 15, the last date for which figures are available, 101 Class I roads, representing 97 per cent of all such roads, reported that vacancies in section and extra-gang laborers, including normal turnover as well as actual shortages, totaled 29,765 men.

As might be expected, the greatest deficiency in maintenance labor has occurred, and continues to occur, along the Pacific coast, the North Atlantic seaboard, and the Gulf coast. In all of these areas, deficiencies have been the most serious in extra-gang labor, these ranging up to 40 per cent, although some roads have had difficulty in maintaining adequate section labor as well, and nearly all roads have experienced shortages in practically all categories of skilled labor, including bridge and build-

ing carpenters, painters, water service repairmen, signal construction forces, operators of power machines, and welders.

In some sections, particularly along the Pacific coast, it is practically impossible to obtain welders.

In the maintenance of equipment department the situation with respect to labor supply involves several considerations. While it has been stated that the same shop force can contribute to the handling of more trains this is true only up to the limit of reserve shop capacity. By that is meant that in normal times a shop does not work the maximum number of days in a month or year so that by increasing the number of days worked a fixed force may increase output in proportion to the increase in man-hours. This is evidenced by a 21 per cent increase of machinists' and boilermakers' man-hours in 1942 as compared to 1941. There is, however, a limit to the extent to which this can be done and that limit has, to all practical purposes, been reached.

While it is not possible to say, with finality, what the loss in maintenance of equipment forces has been it is significant that some large roads have lost from 8 to 10 per cent to the armed forces. A more serious loss, however, is that of from 20 to 25 per cent to other industries for the reason that these men are, in large part, more highly skilled than those lost to the services.

Women were employed in numerous jobs in the motive-power department during the last war. In its study of the possibilities for the present emergency, the New York Central considers it possible to use women on jobs which would amount to about 6¼ per cent of the employees in the department. Even if women could replace men to a much greater extent than this, however, the necessity for the installation of toilet and wash-room facilities at every shop point where the employment of women is anticipated would be a project likely to delay the full effectiveness of the utilization of women for many months to come.

West Hit Hardest

By early October, the track labor problem had become so acute in certain sections of the West that on October 20, Director Eastman of the Office of Defense Transportation, wrote Paul V. McNutt, chairman of the War Manpower Commission, that "the difficulty of manning section and extra crews on western railroads has reached such proportions that quick and effective action is necessary." He pointed out that as of September 15, twelve of the largest western railroads reported that they had 14,359 current unfilled vacancies among section and extra-gang crews, and went on to say that "if our railroads are to be prepared to carry increasingly heavy transportation burdens, track and roadway maintenance must be on a greater scale than ever before."

Subsequently, an ODT announcement said that prompt action to obtain sufficient track labor "for the safe maintenance of track and roadway" on certain western railroads "had been urged upon War Manpower Commissioner McNutt by Director Eastman. The announcement said that Mr. Eastman called for a WMC determination whether such labor could be obtained from domestic sources; and requested that, if the answer is negative, "immediate steps" be taken "to arrange for the importation of labor from Mexico in sufficient numbers to meet the most pressing needs . . . until such time as domestic labor again becomes available." That the situation in the West had not improved up to early December is seen by the fact that at that time the Southern Pacific System was reporting a need for 4,800 additional employees for maintenance of way and structures work, and the Coast Lines of the Atchison, Topeka & Santa Fe reported a shortage of approximately 1,500 employees for these same classes of work.

To the present time, the maintenance labor situation generally in the Great Lakes region and Central West has been much less acute than along the Atlantic and Pacific coasts, except in the larger cities and the vicinity of war industries or ordnance plants. However, most roads in these sections have experienced difficulty in securing extra-gang labor and severe shortages have been reported in some cases in quipment operators and wlders. Except in industrial areas and the vicinity of war plants, most roads in these sections have experienced little difficulty in maintaining the ranks of their section forces, although in some cases, forces have been maintained at normal only by extraordinary recruiting efforts.

In the Southern and Southwestern states, except immediately along the Atlantic seaboard and Gulf coast, the labor problem generally is less severe than in any other part of the country, few roads in these territories having experienced any appreciable difficulty in obtaining all of the section and extra-gang labor required. However, in both of these general areas, some roads are seriously short of, and are having increasing difficulty in finding replacements for, skilled labor, including work equipment operators, welders, steel bridge men, water service repairmen and other classes of mechanics.

With schedules of war production still on the increase, and selective service requirements, augmented by the call of men 18 and 19 years of age, eating further into the dwindling reserve of manpower suitable for maintenance of way and structures work, the problem of the railways generally over the country to maintain and recruit labor for essential track, bridge, building, water service and signal maintenance work, is certain to become progressively more difficult during 1943. This situation will be aggravated further by the provision in the 18 and 19 year old draft law for freezing farm labor, which will make unavailable for railway employment a large number of men who might otherwise have been a source of supply for maintenance work, at least during certain seasons of the year. Indeed, in the face of these facts, it would appear certain that the railroads generally will be confronted with serious shortages in maintenance manpower in 1943, and that on many roads, the labor situation will become critical.

Seek Solution in Many Expedients

Studies that have been made by maintenance officers, individually and collectively, for means of offsetting their growing losses in manpower and to satisfy their increasing labor requirements with enlarged work programs, indicate that the solution to the problem, insofar as a solution can be found, lies in a number of expedients, including the lengthening of the working day beyond eight hours; more intensive programs of constructive work during the winter months, to provide steady employment; more intensive solicitation of manpower by their own supervisory forces, and through their usual agencies and the Federal Employment Service; the employment of women in those positions for which they are adapted physically; the establishment of training courses to increase the efficiency of new, untrained employees, and to equip present employees for advancement into more skilled positions; the relaxation of normal age limits, both upward and downward; the lower-

(*Continued on page 72*)

Highlights in Railway Materials

OEM Photo

Ferdinand Eberstadt, Vice Chairman, WPB, on Program Determination, and Chairman of the Requirements Committee (Previously Chairman of the Army and Navy Munitions Board)—Top Co-ordinator in Material Distribution for War Agencies and Civilian Supply

Carriers managed to keep supply lines open in 1942 but procurement forces worried—WPB launches another plan

By D. A. Steel

Purchases and Stores Editor

THE remarkable thing about the railroads at this time is that they have managed to function so well under the war load, despite extreme difficulty in getting materials and equipment. Outstanding observers have repeatedly noted how well they have carried the troops to their camps and ports; the materials for building war plants and for export; the coal, lumber and raw materials for making munitions and equipment; and the huge load of civilian commerce. They have also won praise for their work in producing scrap metal and for meeting all requirements in furnishing rail and ties for military railroads. Militia guard bridges and tunnels to protect this service from the saboteur. Throughout the long preparation for national defense and then all-out war, they were the one agency that the government and military forces were able to depend upon.

In getting the iron and steel, lumber, tools and equipment needed to maintain that service, however, the struggle continues. At the beginning of the emergency, railroads were placed in the category of civilians, and there they remain. They have had to compete for their needs with innumerable civilian enterprises, including public works, for a share of what is left of the country's production after an ever-expanding number of military agencies and affiliates are satisfied. In October, over 90 per cent of the steel was ordered by metal plants for war material. They have had to follow rules and regulations in the procurement and distribution of materials which were prepared with little, if any, intimate understanding of the far-flung but interconnected and constantly moving nature of railway operation. It has been necessary to leave the presentation of their over-all needs to persons not of their own choosing, and abide by decisions from boards on which they have had no direct representation and before which they have no opportunity to speak as railroads.

The railroads have also had to apply individually and item for item, initially or eventually, for their materials

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Women were employed in numerous jobs in the motive-power department during the last war. In its study of the possibilities for the present emergency, the New York Central considers it possible to use women on jobs which would amount to about 6¼ per cent of the employees in the department. Even if women could replace men to a much greater extent than this, however, the necessity for the installation of toilet and wash-room facilities at every shop point where the employment of women is anticipated would be a project likely to delay the full effectiveness of the utilization of women for many months to come.

West Hit Hardest

By early October, the track labor problem had become so acute in certain sections of the West that on October 20, Director Eastman of the Office of Defense Transportation, wrote Paul V. McNutt, chairman of the War Manpower Commission, that "the difficulty of manning section and extra crews on western railroads has reached such proportions that quick and effective action is necessary." He pointed out that as of September 15, twelve of the largest western railroads reported that they had 14,359 current unfilled vacancies among section and extra-gang crews, and went on to say that "if our railroads are to be prepared to carry increasingly heavy transportation burdens, track and roadway maintenance must be on a greater scale than ever before."

Subsequently, an ODT announcement said that prompt action to obtain sufficient track labor "for the safe maintenance of track and roadway" on certain western railroads "had been urged upon War Manpower Commissioner McNutt by Director Eastman. The announcement said that Mr. Eastman called for a WMC determination whether such labor could be obtained from domestic sources; and requested that, if the answer is negative, "immediate steps" be taken "to arrange for the importation of labor from Mexico in sufficient numbers to meet the most pressing needs . . . until such time as domestic labor again becomes available." That the situation in the West had not improved up to early December is seen by the fact that at that time the Southern Pacific System was reporting a need for 4,800 additional employees for maintenance of way and structures work, and the Coast Lines of the Atchison, Topeka & Santa Fe reported a shortage of approximately 1,500 employees for these same classes of work.

To the present time, the maintenance labor situation generally in the Great Lakes region and Central West has been much less acute than along the Atlantic and Pacific coasts, except in the larger cities and the vicinity of war industries or ordnance plants. However, most roads in these sections have experienced difficulty in securing extra-gang labor and severe shortages have been reported in some cases in quipment operators and wlders. Except in industrial areas and the vicinity of war plants, most roads in these sections have experienced little difficulty in maintaining the ranks of their section forces, although in some cases, forces have been maintained at normal only by extraordinary recruiting efforts.

In the Southern and Southwestern states, except immediately along the Atlantic seaboard and Gulf coast, the labor problem generally is less severe than in any other part of the country, few roads in these territories having experienced any appreciable difficulty in obtaining all of the section and extra-gang labor required. However, in both of these general areas, some roads are seriously short of, and are having increasing difficulty in finding replacements for, skilled labor, including work equipment operators, welders, steel bridge men, water service repairmen and other classes of mechanics.

With schedules of war production still on the increase, and selective service requirements, augmented by the call of men 18 and 19 years of age, eating further into the dwindling reserve of manpower suitable for maintenance of way and structures work, the problem of the railways generally over the country to maintain and recruit labor for essential track, bridge, building, water service and signal maintenance work, is certain to become progressively more difficult during 1943. This situation will be aggravated further by the provision in the 18 and 19 year old draft law for freezing farm labor, which will make unavailable for railway employment a large number of men who might otherwise have been a source of supply for maintenance work, at least during certain seasons of the year. Indeed, in the face of these facts, it would appear certain that the railroads generally will be confronted with serious shortages in maintenance manpower in 1943, and that on many roads, the labor situation will become critical.

Seek Solution in Many Expedients

Studies that have been made by maintenance officers, individually and collectively, for means of offsetting their growing losses in manpower and to satisfy their increasing labor requirements with enlarged work programs, indicate that the solution to the problem, insofar as a solution can be found, lies in a number of expedients, including the lengthening of the working day beyond eight hours; more intensive programs of constructive work during the winter months, to provide steady employment; more intensive solicitation of manpower by their own supervisory forces, and through their usual agencies and the Federal Employment Service; the employment of women in those positions for which they are adapted physically; the establishment of training courses to increase the efficiency of new, untrained employees, and to equip present employees for advancement into more skilled positions; the relaxation of normal age limits, both upward and downward; the lower-

(*Continued on page 72*)

Highlights in Railway Materials

OEM Photo

Ferdinand Eberstadt, Vice Chairman, WPB, on Program Determination, and Chairman of the Requirements Committee (Previously Chairman of the Army and Navy Munitions Board)—Top Co-ordinator in Material Distribution for War Agencies and Civilian Supply

Carriers managed to keep supply lines open in 1942 but procurement forces worried—WPB launches another plan

By D. A. Steel

Purchases and Stores Editor

THE remarkable thing about the railroads at this time is that they have managed to function so well under the war load, despite extreme difficulty in getting materials and equipment. Outstanding observers have repeatedly noted how well they have carried the troops to their camps and ports; the materials for building war plants and for export; the coal, lumber and raw materials for making munitions and equipment; and the huge load of civilian commerce. They have also won praise for their work in producing scrap metal and for meeting all requirements in furnishing rail and ties for military railroads. Militia guard bridges and tunnels to protect this service from the saboteur. Throughout the long preparation for national defense and then all-out war, they were the one agency that the government and military forces were able to depend upon.

In getting the iron and steel, lumber, tools and equipment needed to maintain that service, however, the struggle continues. At the beginning of the emergency, railroads were placed in the category of civilians, and there they remain. They have had to compete for their needs with innumerable civilian enterprises, including public works, for a share of what is left of the country's production after an ever-expanding number of military agencies and affiliates are satisfied. In October, over 90 per cent of the steel was ordered by metal plants for war material. They have had to follow rules and regulations in the procurement and distribution of materials which were prepared with little, if any, intimate understanding of the far-flung but interconnected and constantly moving nature of railway operation. It has been necessary to leave the presentation of their over-all needs to persons not of their own choosing, and abide by decisions from boards on which they have had no direct representation and before which they have no opportunity to speak as railroads.

The railroads have also had to apply individually and item for item, initially or eventually, for their materials

to men in numerous bureaus, many of whom were strangers to railway supply work, some of whom have been antagonistic to railroads, while others have been severely hindered in concentrating on railroad problems by the burden of details required from other manufacturers and consumers, by their own interdepartmental relations and by the uncertainties created by the continual changes in their own organization and procedure. This situation has not been relieved, moreover, by the reluctance with which WPB has released the basic facts which it has required railroads to compile and report, at great expense, for its information in formulating plans and administering programs.

Railroads Patient

The railroads are aware of the national emergency, the limitations which must be placed upon the diversion of materials from the production of things needed by the armed forces and the impossibility of devising any system of control which will work smoothly, especially with so little material available for all demands. They have been forebearing and co-operative. They have with alacrity changed specifications of materials to conform to approved standards to simplify the problem of manufacture and distribution. They have performed monumental work in conservation and reclamation to save materials in use and reduce their requirements of new materials. They have obeyed the rules of the new order of material distribution to the extent to which they have been able to interpret and understand them.

The conditions under which they have been obtaining their materials, however, have been trying. One intimate observer of the problem says the procurement situation is terrible. Another is convinced that WPB is not doing its job. It is another's conclusion that if the roads depended upon WPB allocations, they would be broken down. In still another quarter, the situation is appraised as one of utmost confusion. Recently, a railroad made equipment required for moving raw material to fill urgent government orders and assembled the equipment entirely from second hand material with the exception of a carload of structural steel, but after extended negotiations got only an A-1-a rating for the steel at a time when the futility of such a rating for steel was well known to WPB. While another railroad waited for steel, hundreds of tons of steel were lying in a nearby yard for military programs which had been discontinued. Again, tie production has been seriously reduced for want of men; yet able-bodied Japanese, who refused offers of employment in tie production, have been permitted to remain idle in internment camps.

Uncertain Deliveries

A glimpse of the current railway material situation confronting the railroads is afforded by a recent poll of railway experience. There are still a few railway men who are not afraid to speak. The rail, springs, boiler tubes, malleable castings, grey iron castings, locomotive tires, car axles, machine parts and electrical material allocated by WPB are not being delivered within the scheduled time on 10 per cent of the roads, according to this poll; and bar steel, boiler plate, bridge timbers and lumber are not being delivered within the scheduled time on 20 per cent of them. Ten per cent are not receiving rail and malleable castings sufficiently rapidly for existing needs at the present rate of consumption. On 20 per cent, rate of delivery is insufficient for the present rate of consumption on springs, boiler tubes, boiler plate, steel castings, car axles, machine parts, electrical material and car lumber. On 40 per cent, delivery rates are insufficient on bar steel, cross ties and bridge lumber.

When the poll was made, one road was out of boiler plate, certain sizes of steel castings, electrical material and journal bearings. Another road was out of 2-in. boiler tubes. Another road was well protected in most of the items only because of material it salvaged from dismantled equipment. One road is idling on authorized yard extensions, interlocking construction and crossing protections because of lack of rail, tie plates, signal material and bridge lumber. Another road is facing a serious situation growing out of the shortage of several items of lumber and steel, particularly car sills and sheathing. In another place, boiler work is at a standstill because of a shortage of boiler steel.

Scarce items which are giving railroads an acute material problem are rail, tie plates, signal wire, bridge lumber, bronze bearings, boiler plate, steel bars, coil springs, welding rod, tools, alloy metals including copper alloys and miscellaneous locomotive appliances and forgings. Troops were recently hauled in coaches which had no coil springs.

Priorities Inadequate

At this time last year, car and locomotive construction was way behind schedule despite an A-3 priority for materials for new work, and the railroads were getting only an A-10 priority for maintenance material. SPAB (Supply Priorities and Allocations Board) of OPM (Office of Production Management), after much prodding, tried to remedy the equipment situation by agreeing to provide materials for building 36,000 freight cars in February, March and April, beyond the 9,000 cars to be completed in January, and enough material to continue production through February, March and April on 926 locomotives. ODT (Office of Defense Transportation), which had just been formed, reported that the program would require during the first quarter 1,414,000 tons of steel, 354,000 tons of castings, 20,000 tons of non-ferrous metal and 570,000 tons of copper; and it was agreed that the new equipment must be limited to AAR recommended standards. Passenger equipment was out. WPB (War Production Board), with Donald Nelson as chairman, succeeded OPM, and a Requirements Committee, with William Batt (SKF) as chairman, superseded SPAB and railroads were promised further relief. This came early in February in the form of an allotment of 900,530 tons of steel, 2,250 tons of copper for maintenance of way and structures, together with an allotment of 530,000 tons of steel for rail and fastenings for the first quarter, with the proviso that relay rail must be released up to one third of the new rail, but the materials were not forthcoming for the equipment program. Previously ODT, with the assistance of the AAR, had placed iron and steel requirements for the year by railroads and car and locomotive builders at 6,613,113 net tons, including 4,424,632 tons for railway maintenance, in which was 1,632,394 net tons of rails.

A further relief measure came in March in the P-88 regulation under which railroads are still operating, giving (1) an A-1-a rating for emergency material for maintenance of way and structures; (2) other ratings at the discretion of WPB for quantities of certain critical materials ordered on a quarterly basis and approved by WPB after an examination of detailed forms showing the amount on hand, due, etc.; (3) an A-1-j rating (as

later amended) on a quarterly basis for other described items for keeping up inventories of material authorized for maintenance and small improvement work; and (4) an A-8 rating for other material not held in excess as revealed by inventory data.

This system of providing for materials on a quarterly basis was duplicated in a fashion in June by PRP (Production Requirements Plan) covering the requirements of manufacturers, including manufacturing railroads, and had merit until top ratings in the priority system were raised and A-1-a became as common as A-10 had been. By July, the top rating was AAA. A month later AA-1 and AA-2 were combined and a new rating, AA-2X, was inserted ahead of AA-3 for those who could rate it in the judgment of WPB; and directives were being increasingly used to get material for emergencies.

The April Allocation

On April 6, WPB announced that materials would be allocated during the remainder of 1942 for the construction of an additional 18,000 freight cars and 300 locomotives for domestic use in an effort to assure adequate transportation of war supplies. It was also announced that additional materials would be made available to complete army and lend-lease orders for railroad equipment, and that if necessary, materials would continue to be made available for uncompleted portions of the equipment authorized in January, but no materials were authorized for the further production of refrigerator cars or for passenger cars and only enough materials for a moderate number of tank cars. At the same time, Orders L-97 and L-97-a froze all finished locomotives and freight and passenger cars in the hands of producers and the materials on hand for them, and empowered WPB to determine what equipment was to be built, who would build it and to whom it would be delivered. Materials accumulated in 1941 and early in 1942 by car builders and railroads for equipment building were eventually made the subject of Order L-97-a-1, permitting their sale for use on authorized cars, and in November, the order was finally amended to release similar materials which had been held by locomotive and passenger car builders; but the order stopped permanently the construction of many freight and passenger cars which were almost completed at the time and left millions of dollars of materials idle for months, including large tonnages which are still unused.

In purchasing lumber, the railroads were hit hard, first, by Order L-121, effective May 13, which prohibited sales and deliveries of construction lumber by large producers except to the Army, Navy and Maritime Commission. This freeze order was replaced on August 27 by Order M-208, placing softwood lumber produced east of the Cascade mountains into classifications in the order of their scarcity and prohibiting their purchase without special authorization and priority ratings, which have been difficult for railroads to obtain. The situation is even worse with West Coast Douglas fir, which was frozen under Order L-218 which prohibited railroads since the order became effective on October 29, to place orders for this lumber without submitting detailed inventory and consumption data to the administrator of the order—now stationed on the West Coast—and obtaining his authority for each order. The fact that the railroads are normally among the largest consumers of lumber affords some indication of the difficulties they have been facing since last spring in obtaining their requirements for maintenance.

On November 19, the railroads were told how much new equipment and maintenance materials they would be permitted to order for delivery in 1943, the authorization consisting of 286 locomotives to be built in the first 8 months of 1943, and deliveries of steel in the first quarter 330,000 tons for repairs and equipment, 480,000 tons of rails and 288,000 tons of track accessories.

The tightness of the material situation and the friction that was rapidly developing in and out of WPB had its repercussion in several significant changes in organization which were made since last fall. In July, all branches of the WPB were put under a director general of operation. On September 18, C. E. Wilson (General Electric) was appointed vice-chairman of WPB and chairman of a newly created Production Executive Committee to function as the top production authority in the war program. Other members are Lt. Gen. B. B. Somervell, commanding general, Service of Supply, U. S. Army; Maj. Gen. O. P. Echols, commanding general, Materials Command Headquarters, Army Air Force; Vice-Admiral S. M. Robertson, director of materials and procurement, U. S. Navy; and Rear Admiral H. L. Vickery, vice-chairman, U. S. Maritime Commission. This was followed on September 20 by drafting Ferdinand Eberstadt from his position as chairman of the Army and Navy Munitions Board to become vice-chairman of WPB, with responsibility for the preparation of production and material schedules. To effectuate this plan, the Office of Program Determination and the Office of Operations were combined. Industry branches were given the status of divisions, with greater responsibility of estimating requirements and controlling the distribution of materials. These divisions were further grouped into five operating bureaus. The Transportation Equipment Division is grouped with the Construction and Utilities Bureau, of which John Hall (American Radiator & Standard Sanitary Corp.) is director. Attached to each of the 36 divisions is a representative of the labor administration, the customary Industrial Advisory committee, and representatives of the Army, Navy, Maritime Commission and the Office of Civilian Supply.

Controlled Materials Plan

As it now appears, these changes in the organization of WPB were made in contemplation of another plan which has since been announced for controlling the distribution of materials. This plan, which has been christened CMP (Controlled Materials Plan), is restricted in its present form to the distribution of steel, aluminum and magnesium and to articles and assemblies containing these materials, but will be extended to other critical materials. When fully effective next July, it will replace PRP, under which manufacturers and manufacturing railroads obtain their materials and, to some extent at least, the P-88 plan by which railroads obtain operating and maintenance supplies.

The idea behind this plan, which has been given a lavish build-up by its authors, is to tie together the control of schedules by making raw material allotments through the same channels that are followed in setting production schedules. Under CMP, the army unit that establishes production schedules with prime contractors for tanks will also allot the material, following which the prime contractor will both set up the schedules of production and allot the materials for subcontractors. If it becomes necessary to cut the amount of materials available for tanks, the army will correspondingly reduce the

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Railways Evidence Earning Power

Industry bears witness to great economic vitality, with favorable earnings despite wage and tax rise, lower charges

By J. G. Lyne

Assistant to Editor

THE earnings figures of the railroad industry in 1942 sharply refuted two libels which have issued against it in recent years—(1) that the railroads were overbuilt in relation to latter-day demand for their services and (2) that they were an "old" industry, no longer capable of advancing earnings and improving their economy.

As their answer to the first canard, the railroads in 1942 have performed 35 per cent more freight service (revenue ton-miles) than in 1941, which was the largest total in previous history. They moved a greater number of passenger-miles than in 1920, which was the previous record for such traffic. Furthermore, the business offered pressed hard upon railroad plant—if facilities had been more ample (particularly for passenger business) more traffic could have been moved than was moved. Plainly, therefore, present-day railroad plant is *not* excessive and overbuilt—as detractors had plausibly insisted for a decade. Furthermore, it is depressing to consider what would now be happening to the war program and to the civilian economy if the railroads had allowed themselves to be persuaded by their critics, and had actually reduced their plant and capacity by a quarter or a third. Such action would now constitute national calamity, as needs for service from the railroads in 1942 have clearly proved.

What about the second libel—that the railroads were "old," "finished," incapable of further marked improvement in efficiency or earning power? Well—in the first eight months of 1942, the railroads performed 38 per cent more freight service (revenue ton-miles) than in the same 1929 period, and they did this job for only 18 per cent more freight revenue than they received in the first two-thirds of 1929. In the first eight months of 1942, passenger service performed was 45 per cent greater than in the comparable 1929 period, but charges for this vastly greater service were *less* in aggregate than in 1929. The reduction in average ton-mile revenue was 14 per cent and in average passenger-mile revenue was 32 per cent.

Benefits to Employees, Patrons, Tax Receipts

Despite these large savings to customers, however, the railroads had larger net earnings (net railway operating income) than they ever did before, in the first ten months of the year. Such earnings were 1,160 millions in the first ten months of 1942, compared to 1,116 millions in the same period of 1929. It was not only their customers, however, who benefited from the great efficiency with which the railroads were operated in 1942. Their employees and the tax collector garnered even larger benefits. Average hourly earnings of employees were 29 per cent higher in the fall of 1942 than in the fall of 1929, and tax accruals for the first ten months were almost three times as large as in the same period of 1929—over a billion dollars, as compared to 349 millions in that period of 1929.

Economic Health Is Demonstrated

Lower rates to customers, enormously increased wages, and prodigiously higher taxes—and yet the railroad industry had more net earnings than it ever did before! Better equipment and materials, and, especially, the utmost resourcefulness and ingenuity by management in the use of available facilities, brought this performance about. There is no evidence here that the railroads are an "old" industry, incapable of further improvement—but, instead, most palpable proof demonstrating quite an opposite conclusion. The railroads, in short, are just as fruitful an object for wise capital expenditures and for the application of managerial skill as ever they were—perhaps even more so. Experience of the past year has demonstrated that there was much truth in the statement made by some optimists during the deep depression of the 'Thirties to the effect that "there isn't anything wrong with the railroads that a large volume of national production and traffic won't cure."

The railroads thus have testified to their *intrinsic* health—but they are not any more in control of the *extrinsic political conditions* now threatening their immediate future than they were of the extrinsic political conditions which prolonged the depression of the 'Thirties.

The Office of Price Administration—charged by law with combatting "inflation"—is attacking the railroad rate structure before the Interstate Commerce Commission (despite the fact that average railroad revenue per ton-mile is averaging less now than it did in 1941). Railroad net earnings are not "inflationary"—about the only thing they can be spent for is strictly-rationed material to keep the railroads going and for paying or anticipating debts. Very little can go into more and larger dividends. Besides, the tax collector will get 50 per cent or more of all railway net earnings anyhow. The O. P. A., however, says nothing (or, at any rate, has not done so yet) about the increase in wages being sought by the railway unions. That, of course, *would* be inflationary because it would put more money into the pockets of individuals, which, in turn, would bid up the prices of the declining stock of consumers' goods. To reduce passenger fares would similarly put more money into the pockets of individuals, and would thus be inflationary for the same reason that a wage increase would be.

As long as it is government policy not to do anything to discourage efforts by the railway unions to secure further fantastic increases in their wages—and as long as government policy tries to beat down railroad rates, which are about the only thing there is which, on the average, is now lower in price than in 1941, obviously nobody can predict how profitable railroading is going

Earnings of "Large Steam Railways", Ten Months, 1942, 1939 and 1929

Name of Railroad	OPERATING REVENUES					NET FROM RAILWAY OPERATIONS					NET RAILWAY OPERATING INCOME				
	10 Months 1942	10 Months 1939	% 1942 of 1939	10 Months 1929	% 1942 of 1929	10 Months 1942	10 Months 1939	% 1942 of 1939	10 Months 1929	% 1942 of 1929	10 Months 1942	10 Months 1939	% 1942 of 1939	10 Months 1929	% 1942 of 1929
Alton	25,323,765	13,723,013	185	24,440,232	104	9,124,205	3,321,957	275	5,922,760	154	3,869,828	610,062	634	3,028,425	128
Atchison, Topeka & Santa Fe	291,408,561	132,837,663	219	187,316,840	156	129,142,274	28,688,337	450	66,826,856	193	64,522,435	15,495,344	416	50,564,603	128
Atlantic Coast Line	90,567,757	39,016,907	232	61,470,417	147	39,013,269	8,785,318	444	16,632,830	235	17,015,217	3,003,673	566	11,414,490	149
Baltimore & Ohio	251,481,658	130,116,497	193	208,988,441	120	83,307,273	33,501,285	249	57,110,542	146	48,834,937	20,626,698	237	43,514,963	112
Boston & Maine	64,341,833	38,245,901	168	66,100,250	97	23,375,405	10,871,431	215	16,917,001	138	11,823,018	5,537,605	214	11,312,177	105
Central of Georgia	23,554,837	12,812,702	184	21,194,133	111	8,006,482	1,677,710	477	5,048,852	159	5,923,425	494,194	1199	3,797,105	156
Central of New Jersey	47,707,864	27,512,110	173	48,845,992	98	15,252,786	7,453,734	205	13,529,291	113	7,479,458	1,497,417	499	7,903,032	95
Chesapeake & Ohio	150,553,937	96,978,245	155	108,521,975	139	71,577,174	40,392,460	177	36,862,219	194	30,388,688	28,972,622	105	31,753,845	96
Chicago & Eastern Illinois	19,367,301	12,625,585	153	21,504,399	90	6,292,262	2,777,137	227	4,937,761	127	2,954,554	695,988	425	2,057,791	144
Chicago & North Western	113,828,627	72,725,178	157	132,416,763	86	35,707,062	12,262,137	291	36,104,993	99	20,740,086	4,410,742	470	25,220,388	82
Chicago, Burlington & Quincy	132,541,814	79,366,486	167	137,340,527	97	52,450,128	19,867,719	264	44,864,733	117	28,424,261	8,944,883	318	31,010,846	92
Chicago Great Western	20,894,948	15,043,115	139	21,699,570	96	7,399,721	4,163,190	178	4,900,197	151	2,618,438	1,260,681	208	2,336,749	112
Chicago, Mil., St. P. & Pac.	146,589,748	88,565,051	166	146,232,065	100.2	50,414,122	16,520,797	305	37,108,559	136	27,385,497	5,279,839	519	23,104,477	119
Chicago, Rock Island & Pac.	110,180,964	65,744,688	168	124,362,010	89	41,790,776	12,890,182	324	33,399,540	125	29,952,853	4,298,018	697	21,150,752	142
Chicago, St. Paul, Minneap. & Omaha	19,306,093	14,686,523	131	22,925,843	84	4,763,618	2,180,268	218	4,939,194	96	2,615,828	—62,552	...	3,087,196	85
Delaware & Hudson	38,134,788	21,037,847	181	34,692,507	109	13,494,750	6,609,079	204	7,841,075	172	7,789,333	4,573,964	170	6,937,867	112
Delaware, Lackawanna & West'n	60,170,503	41,572,633	145	68,677,667	88	19,900,412	9,700,908	205	20,291,993	98	9,382,111	4,777,556	196	14,590,234	64
Denver & Rio Grande Western	43,137,889	20,515,545	210	28,906,893	149	17,813,241	3,560,844	500	8,516,419	209	14,340,565	912,597	158	7,214,422	199
Duluth, Missabe & Iron Range	39,370,602	16,351,408	241	26,506,750	149	26,353,656	9,185,289	287	16,028,529	164	7,024,211	7,047,289	99	13,623,318	52
Elgin, Joliet & Eastern	28,162,177	13,966,337	202	22,725,865	124	10,867,982	4,058,801	268	8,699,344	125	2,744,020	2,192,967	125	5,343,121	51
Erie	110,906,130	66,706,045	166	96,636,135	115	40,455,241	17,928,843	226	21,848,408	185	20,379,351	9,510,219	214	16,838,708	121
Grand Trunk Western	25,226,000	17,526,921	144	19,237,428	131	6,861,828	2,791,560	246	5,090,730	135	4,522,678	763,694	592	3,055,879	148
Great Northern	135,473,817	77,812,867	174	108,459,226	125	58,424,946	26,679,048	219	36,320,158	161	31,829,813	16,481,492	193	27,564,789	115
Gulf, Mobile & Ohio	26,999,719	15,493,722	174	21,381,576	126	10,291,279	3,928,835	262	5,794,840	178	4,447,372	1,730,985	257	3,612,453	123
Illinois Central System	173,963,450	91,515,621	190	152,577,703	114	63,257,602	23,772,139	266	35,333,577	179	31,823,535	13,954,590	228	23,395,911	136
Lehigh Valley	63,659,486	37,403,124	170	60,902,083	105	22,459,643	10,155,613	221	16,099,732	140	10,070,245	5,669,969	178	11,453,539	88
Louisville & Nashville	136,892,998	72,241,062	189	112,246,823	122	55,472,276	19,072,479	291	22,997,047	241	19,629,229	12,767,450	154	17,251,536	114
Minneapolis, St. P. & S. Ste. M.	35,648,571	23,660,294	151	41,609,946	86	10,488,086	5,454,164	192	11,724,200	89	6,588,444	2,509,155	263	7,723,235	85
Missouri-Kansas-Texas Lines	45,303,904	23,669,442	191	47,199,742	96	13,853,563	5,000,413	277	15,120,511	92	7,634,615	1,161,321	657	9,997,758	76
Missouri Pacific	143,799,935	68,536,290	210	118,335,835	122	61,638,819	14,192,413	434	31,908,249	193	41,298,902	5,383,471	767	21,173,815	195
New York Central	486,556,328	278,363,006	175	335,472,661	145	156,183,327	69,011,812	226	83,480,571	187	70,531,750	28,418,491	248	57,442,306	123
Pittsburgh & Lake Erie	28,430,525	15,019,849	189	29,237,347	97	8,711,996	2,151,311	405	5,263,485	166	5,427,179	2,538,117	214	6,981,639	78
New York, Chicago & St. Louis	72,617,115	35,122,521	207	48,320,461	150	34,228,525	11,616,222	295	14,727,457	232	11,769,428	6,383,987	179	9,601,860	123
New York, New Haven & Hartford	127,908,081	68,663,202	186	118,103,310	108	51,471,288	17,383,936	296	39,621,239	130	24,444,705	6,108,805	400	27,390,967	89
Norfolk & Western	115,366,165	75,320,244	153	97,974,149	118	51,830,617	32,974,731	157	42,726,174	121	18,958,568	24,517,200	77	36,492,357	52
Northern Pacific	95,650,986	53,300,916	179	81,918,915	117	32,595,807	10,881,359	300	22,221,430	147	21,917,621	7,569,613	290	18,333,374	120
Pennsylvania	691,505,861	347,951,655	199	579,372,182	117	235,763,900	99,090,619	238	168,630,145	140	115,570,557	58,374,098	198	118,760,552	97
Long Island	29,082,150	21,837,963	133	35,131,457	83	8,000,052	5,718,282	140	12,268,686	65	1,988,200	398,360	499	7,918,561	25
Pere Marquette	35,927,151	24,444,010	147	41,754,328	86	9,458,074	5,174,594	183	13,497,006	70	5,023,527	2,377,381	211	9,359,168	54
Reading	84,734,211	46,145,495	184	81,110,480	104	31,757,695	13,756,998	231	17,830,736	178	17,478,186	9,379,793	193	14,236,416	123
St. Louis-San Francisco	68,673,145	37,869,994	181	71,867,708	96	23,995,843	5,906,146	406	21,975,476	109	19,867,537	2,825,483	70	18,004,741	110
St. Louis, San Francisco & Tex.	2,740,836	1,322,397	207	1,631,717	168	1,303,034	250,988	519	374,462	348	913,183	—88,281	....	73,712	1239
St. Louis Southwestern Lines	38,850,091	16,077,892	242	22,050,510	176	19,641,935	3,171,416	619	5,170,711	380	7,590,262	739,709	1026	3,156,957	240
Seaboard Air Line	87,857,870	35,987,329	244	48,930,636	180	35,361,258	5,910,876	598	13,035,578	271	24,360,868	2,193,040	1111	9,101,069	268
Southern	165,590,286	81,368,761	204	120,847,693	137	71,533,014	25,093,983	285	34,972,807	205	32,814,375	16,187,495	203	26,003,566	126
Southern Pacific	296,064,001	138,253,377	214	192,111,347	154	117,223,511	38,388,169	305	63,559,046	184	59,580,350	18,816,182	317	42,863,939	139
Texas & New Orleans	80,640,119	35,799,350	225	62,693,221	129	38,144,626	9,101,250	419	16,779,663	227	18,699,134	3,895,230	400	10,142,596	184
Texas & Pacific	40,693,804	21,733,253	187	38,541,924	106	16,838,905	6,168,707	273	11,936,776	141	9,341,750	3,533,703	240	7,580,773	123
Union Pacific System	276,434,724	136,261,385	203	187,379,396	148	100,165,691	35,867,289	279	60,675,589	165	42,046,081	14,291,276	294	39,207,256	107
Wabash	64,098,273	36,473,384	176	65,691,005	98	25,313,015	8,152,472	310	17,903,834	141	7,389,625	2,327,869	317	11,814,153	63

Railways Evidence Earning Power

Industry bears witness to great economic vitality, with favorable earnings despite wage and tax rise, lower charges

By J. G. Lyne

Assistant to Editor

THE earnings figures of the railroad industry in 1942 sharply refuted two libels which have issued against it in recent years—(1) that the railroads were overbuilt in relation to latter-day demand for their services and (2) that they were an "old" industry, no longer capable of advancing earnings and improving their economy.

As their answer to the first canard, the railroads in 1942 have performed 35 per cent more freight service (revenue ton-miles) than in 1941, which was the largest total in previous history. They moved a greater number of passenger-miles than in 1920, which was the previous record for such traffic. Furthermore, the business offered pressed hard upon railroad plant—if facilities had been more ample (particularly for passenger business) more traffic could have been moved than was moved. Plainly, therefore, present-day railroad plant is *not* excessive and overbuilt—as detractors had plausibly insisted for a decade. Furthermore, it is depressing to consider what would now be happening to the war program and to the civilian economy if the railroads had allowed themselves to be persuaded by their critics, and had actually reduced their plant and capacity by a quarter or a third. Such action would now constitute national calamity, as needs for service from the railroads in 1942 have clearly proved.

What about the second libel—that the railroads were "old," "finished," incapable of further marked improvement in efficiency or earning power? Well—in the first eight months of 1942, the railroads performed 38 per cent more freight service (revenue ton-miles) than in the same 1929 period, and they did this job for only 18 per cent more freight revenue than they received in the first two-thirds of 1929. In the first eight months of 1942, passenger service performed was 45 per cent greater than in the comparable 1929 period, but charges for this vastly greater service were *less* in aggregate than in 1929. The reduction in average ton-mile revenue was 14 per cent and in average passenger-mile revenue was 32 per cent.

Benefits to Employees, Patrons, Tax Receipts

Despite these large savings to customers, however, the railroads had larger net earnings (net railway operating income) than they ever did before, in the first ten months of the year. Such earnings were 1,160 millions in the first ten months of 1942, compared to 1,116 millions in the same period of 1929. It was not only their customers, however, who benefited from the great efficiency with which the railroads were operated in 1942. Their employees and the tax collector garnered even larger benefits. Average hourly earnings of employees were 29 per cent higher in the fall of 1942 than in the fall of 1929, and tax accruals for the first ten months were almost three times as large as in the same period of 1929—over a billion dollars, as compared to 349 millions in that period of 1929.

Economic Health Is Demonstrated

Lower rates to customers, enormously increased wages, and prodigiously higher taxes—and yet the railroad industry had more net earnings than it ever did before! Better equipment and materials, and, especially, the utmost resourcefulness and ingenuity by management in the use of available facilities, brought this performance about. There is no evidence here that the railroads are an "old" industry, incapable of further improvement—but, instead, most palpable proof demonstrating quite an opposite conclusion. The railroads, in short, are just as fruitful an object for wise capital expenditures and for the application of managerial skill as ever they were—perhaps even more so. Experience of the past year has demonstrated that there was much truth in the statement made by some optimists during the deep depression of the 'Thirties to the effect that "there isn't anything wrong with the railroads that a large volume of national production and traffic won't cure."

The railroads thus have testified to their *intrinsic* health—but they are not any more in control of the *extrinsic political conditions* now threatening their immediate future than they were of the extrinsic political conditions which prolonged the depression of the 'Thirties.

The Office of Price Administration—charged by law with combatting "inflation"—is attacking the railroad rate structure before the Interstate Commerce Commission (despite the fact that average railroad revenue per ton-mile is averaging less now than it did in 1941). Railroad net earnings are not "inflationary"—about the only thing they can be spent for is strictly-rationed material to keep the railroads going and for paying or anticipating debts. Very little can go into more and larger dividends. Besides, the tax collector will get 50 per cent or more of all railway net earnings anyhow. The O. P. A., however, says nothing (or, at any rate, has not done so yet) about the increase in wages being sought by the railway unions. That, of course, *would* be inflationary because it would put more money into the pockets of individuals, which, in turn, would bid up the prices of the declining stock of consumers' goods. To reduce passenger fares would similarly put more money into the pockets of individuals, and would thus be inflationary for the same reason that a wage increase would be.

As long as it is government policy not to do anything to discourage efforts by the railway unions to secure further fantastic increases in their wages—and as long as government policy tries to beat down railroad rates, which are about the only thing there is which, on the average, is now lower in price than in 1941, obviously nobody can predict how profitable railroading is going

Earnings of "Large Steam Railways", Ten Months, 1942, 1939 and 1929

Name of Railroad	OPERATING REVENUES					NET FROM RAILWAY OPERATIONS					NET RAILWAY OPERATING INCOME				
	10 Months 1942	10 Months 1939	% 1942 of 1939	10 Months 1929	% 1942 of 1929	10 Months 1942	10 Months 1939	% 1942 of 1939	10 Months 1929	% 1942 of 1929	10 Months 1942	10 Months 1939	% 1942 of 1939	10 Months 1929	% 1942 of 1929
Alton	25,323,765	13,723,013	185	24,440,232	104	9,124,205	3,321,957	275	5,922,760	154	3,869,828	610,062	634	3,028,425	128
Atchison, Topeka & Santa Fe	291,408,561	132,837,663	219	187,316,840	156	129,142,274	28,688,337	450	66,826,856	193	64,522,435	15,495,344	416	50,564,603	128
Atlantic Coast Line	90,567,757	39,016,907	232	61,470,417	147	39,013,269	8,785,318	444	16,632,830	235	17,015,217	3,003,673	566	11,414,490	149
Baltimore & Ohio	251,481,658	130,116,497	193	208,988,441	120	83,307,273	33,501,285	249	57,110,542	146	48,834,937	20,626,698	237	43,514,963	112
Boston & Maine	64,341,833	38,245,901	168	66,100,250	97	23,375,405	10,871,431	215	16,917,001	138	11,823,018	5,537,605	214	11,312,177	105
Central of Georgia	23,554,837	12,812,702	184	21,194,133	111	8,006,482	1,677,710	477	5,048,852	159	5,923,425	494,194	1199	3,797,105	156
Central of New Jersey	47,707,864	27,512,110	173	48,845,992	98	15,252,786	7,458,734	205	13,529,291	113	7,479,458	1,497,417	499	7,903,032	95
Chesapeake & Ohio	150,553,937	96,978,245	155	108,521,975	139	71,577,174	40,392,460	177	36,862,219	194	30,388,688	28,972,622	105	31,753,845	96
Chicago & Eastern Illinois	19,367,301	12,625,585	153	21,504,399	90	6,292,262	2,777,137	227	4,937,761	127	2,954,554	695,988	425	2,057,791	144
Chicago & North Western	113,828,627	72,725,178	157	132,416,763	86	35,707,062	12,262,137	291	36,104,993	99	20,740,086	4,410,742	470	25,220,388	82
Chicago, Burlington & Quincy	132,541,814	79,366,486	167	137,340,527	97	52,450,128	19,867,719	264	44,864,733	117	28,424,261	8,944,883	318	31,010,846	92
Chicago Great Western	20,894,948	15,043,115	139	21,699,570	96	7,399,721	4,163,190	178	4,900,197	151	2,618,438	1,260,681	208	2,336,749	112
Chicago, Mil., St. P. & Pac.	146,589,748	88,565,051	166	146,232,065	100.2	50,414,122	16,520,797	305	37,108,559	136	27,385,497	5,279,839	519	23,104,477	119
Chicago, Rock Island & Pac.	110,180,964	65,744,688	168	124,362,010	89	41,790,776	12,890,182	324	33,399,540	125	29,952,853	4,298,018	697	21,150,752	142
Chicago, St. Paul, Minneap. & Omaha	19,306,093	14,686,523	131	22,925,843	84	4,763,618	2,180,268	218	4,939,194	96	2,615,828	—62,552	...	3,087,196	85
Delaware & Hudson	38,134,788	21,037,847	181	34,692,507	109	13,494,750	6,609,079	204	7,841,075	172	7,789,333	4,573,964	170	6,937,867	112
Delaware, Lackawanna & West'n	60,170,503	41,572,633	145	68,677,667	88	19,900,412	9,700,908	205	20,291,993	98	9,382,111	4,777,556	196	14,590,234	64
Denver & Rio Grande Western	43,137,889	20,515,545	210	28,906,893	149	17,813,241	3,560,844	500	8,516,419	209	14,340,565	912,597	158	7,214,422	199
Duluth, Missabe & Iron Range	39,370,602	16,351,408	241	26,506,750	149	26,353,656	9,185,289	287	16,028,529	164	7,024,211	7,047,289	99	13,623,318	52
Elgin, Joliet & Eastern	28,162,177	13,966,337	202	22,725,865	124	10,867,982	4,058,801	268	8,699,344	125	2,744,020	2,192,967	125	5,343,121	51
Erie	110,906,130	66,706,045	166	96,636,135	115	40,455,241	17,928,843	226	21,848,408	185	20,379,351	9,510,219	214	16,838,708	121
Grand Trunk Western	25,226,000	17,526,921	144	19,237,428	131	6,861,828	2,791,560	246	5,090,730	135	4,522,678	763,694	592	3,055,879	148
Great Northern	135,473,817	77,812,867	174	108,459,226	125	58,424,946	26,679,048	219	36,320,158	161	31,829,813	16,481,492	193	27,564,789	115
Gulf, Mobile & Ohio	26,999,719	15,493,722	174	21,381,576	126	10,291,279	3,928,835	262	5,794,840	178	4,447,372	1,730,985	257	3,612,453	123
Illinois Central System	173,963,450	91,515,621	190	152,577,703	114	63,257,602	23,772,139	266	35,333,577	179	31,823,535	13,954,590	228	23,395,911	136
Lehigh Valley	63,659,486	37,403,124	170	60,902,083	105	22,459,643	10,155,613	221	16,099,732	140	10,070,245	5,669,969	178	11,453,539	88
Louisville & Nashville	136,892,998	72,241,062	189	112,246,823	122	55,472,276	19,072,479	291	22,997,047	241	19,629,229	12,767,450	154	17,251,536	114
Minneapolis, St. P. & S. Ste. M.	35,648,571	23,660,294	151	41,609,946	86	10,488,086	5,454,164	192	11,724,200	89	6,588,444	2,509,155	263	7,723,235	85
Missouri-Kansas-Texas Lines	45,303,904	23,669,442	191	47,199,742	96	13,853,563	5,000,413	277	15,120,511	92	7,634,615	1,161,321	657	9,997,758	76
Missouri Pacific	143,799,935	68,536,290	210	118,335,835	122	61,638,819	14,192,413	434	31,908,249	193	41,298,902	5,383,471	767	21,173,815	195
New York Central	486,556,328	278,363,006	175	335,472,661	145	156,183,327	69,011,812	226	83,480,571	187	70,531,750	28,418,491	248	57,442,306	123
Pittsburgh & Lake Erie	28,430,525	15,019,849	189	29,237,347	97	8,711,996	2,151,311	405	5,263,485	166	5,427,179	2,538,117	214	6,981,639	78
New York, Chicago & St. Louis	72,617,115	35,122,521	207	48,320,461	150	34,228,525	11,616,222	295	14,727,457	232	11,769,428	6,583,987	179	9,601,860	123
New York, New Haven & Hartford	127,908,081	68,663,202	186	118,103,310	108	51,471,288	17,383,936	296	39,621,239	130	24,444,705	6,108,805	400	27,390,967	89
Norfolk & Western	115,366,165	75,320,244	153	97,974,149	118	51,830,617	32,974,731	157	42,726,174	121	18,958,568	24,517,200	77	36,492,357	52
Northern Pacific	95,650,986	53,300,916	179	81,918,915	117	32,595,807	10,881,359	300	22,221,430	147	21,917,621	7,569,613	290	18,333,374	120
Pennsylvania	691,505,861	347,951,655	199	579,372,182	117	235,763,900	99,090,619	238	168,630,145	140	115,570,557	58,374,098	198	118,760,552	97
Long Island	29,082,150	21,837,963	133	35,131,457	83	8,000,052	5,718,282	140	12,268,686	65	1,988,200	398,360	499	7,918,561	25
Pere Marquette	35,927,151	24,444,010	147	41,754,328	86	9,458,074	5,174,594	183	13,497,006	70	5,023,527	2,377,381	211	9,359,168	54
Reading	84,734,211	46,145,495	184	81,110,480	104	31,757,695	13,756,998	231	17,830,736	178	17,478,186	9,579,793	193	14,236,416	123
St. Louis-San Francisco	68,673,145	37,869,994	181	71,867,708	96	23,995,843	5,906,146	406	21,975,476	109	19,867,537	2,825,483	70	18,004,741	110
St. Louis, San Francisco & Tex	2,740,836	1,322,397	207	1,631,717	168	1,303,034	250,988	519	374,462	348	913,183	—88,281	....	73,712	1239
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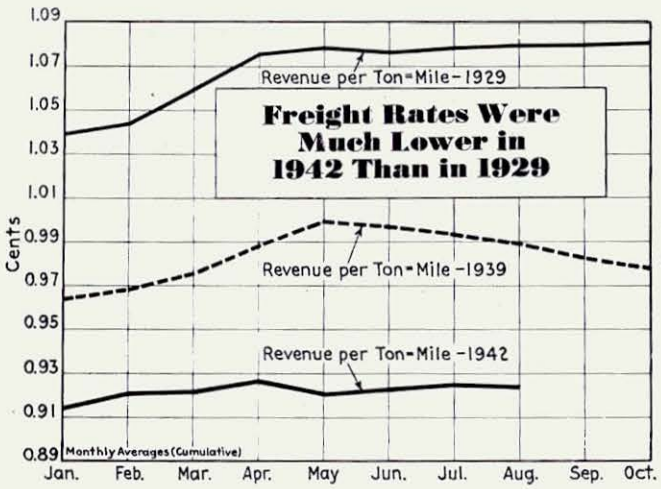
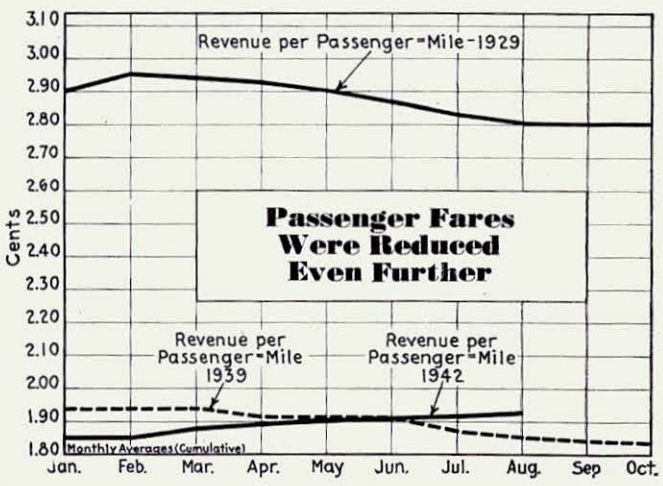
Southern	165,590,286	81,368,761	204	120,847,693	137	71,533,014	25,093,983	285	34,972,807	205	32,814,375	16,187,495	203	26,003,566	126
Southern Pacific	296,064,001	138,253,377	214	192,111,347	154	117,223,511	38,388,169	305	63,559,046	184	59,580,350	18,816,182	317	42,863,939	139
Texas & New Orleans	80,640,119	35,799,350	225	62,693,221	129	38,144,626	9,101,250	419	16,779,663	227	18,699,134	3,895,230	400	10,142,596	184
Texas & Pacific	40,693,804	21,733,253	187	38,541,924	106	16,838,905	6,168,707	273	11,936,776	141	9,341,750	3,533,703	240	7,580,773	123
Union Pacific System	276,434,724	136,261,385	203	187,379,396	148	100,165,691	35,867,289	279	60,675,589	165	42,046,081	14,291,276	294	39,207,256	107
Wabash	64,098,273	36,473,384	176	65,691,005	98	25,313,015	8,152,472	310	17,903,834	141	7,389,625	2,327,869	317	11,819,153	63

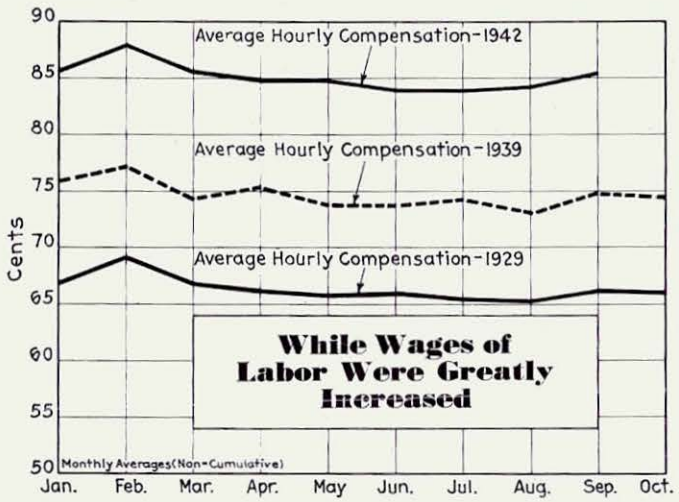
to be in the months which lie ahead. The railroads can either continue to earn as much, net, as they have recently been earning, or, if politics so decrees, their earnings can be arbitrarily shrunk to almost nothing. The point is, there is nothing *intrinsically* wrong with the railroads. Within themselves, they are as sound as they ever were—probably even more so—and they are as sound as any of the "new" industries, which deserve their reputation for "progress" no more than the railroads deserve a similar reputation. The railroads have conclusively demonstrated this year that they are not "sick." The malady from which they have allegedly been suffering has lain, and still lies, entirely in the social and political circumstances which surround them.

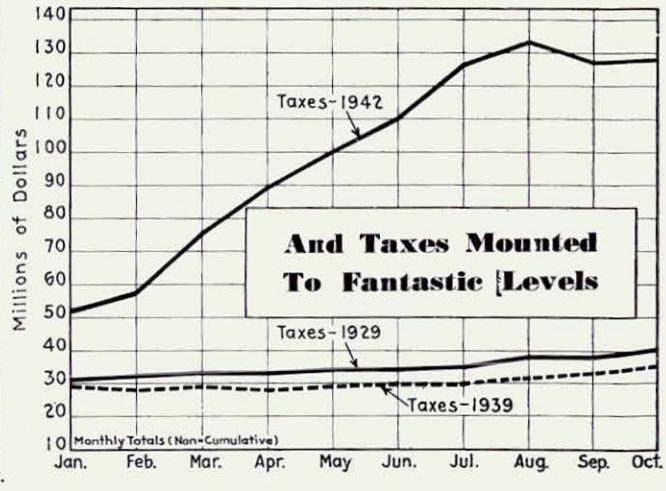
The war has, temporarily at least, boosted national production artificially to some such level as it would

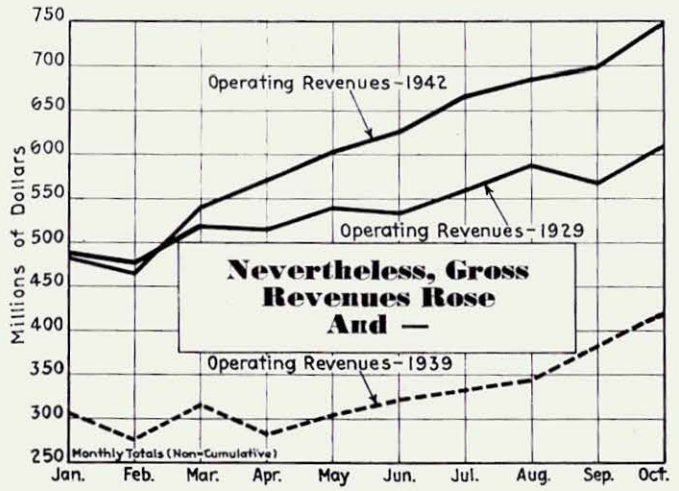
The Railroads Prove Their Economic Virility

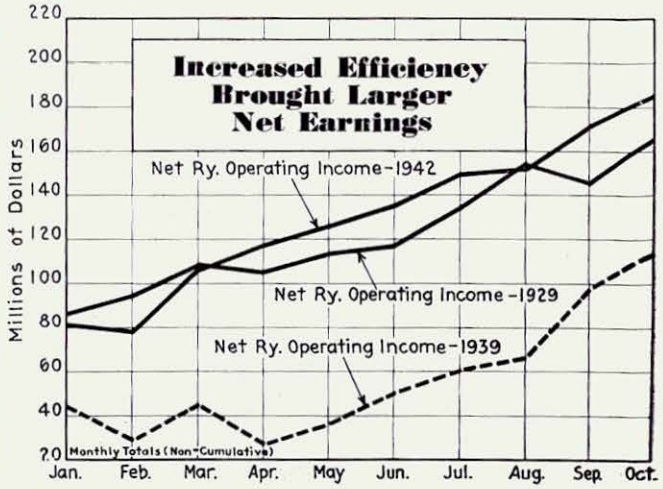

Revenue per Ton-Mile-1929
Freight Rates Were Much Lower in 1942 Than in 1929
Revenue per Ton-Mile-1939
Revenue per Ton-Mile-1942
Cents
Monthly Averages (Cumulative)
Jan. Feb. Mar. Apr. May Jun. Jul. Aug. Sep. Oct.


Revenue per Passenger-Mile-1929
Passenger Fares Were Reduced Even Further
Revenue per Passenger-Mile 1939
Revenue per Passenger-Mile 1942
Cents
Monthly Averages (Cumulative)
Jan. Feb. Mar. Apr. May Jun. Jul. Aug. Sep Oct.


Average Hourly Compensation-1942
Average Hourly Compensation-1939
Average Hourly Compensation-1929
While Wages of Labor Were Greatly Increased
Cents
Monthly Averages (Non-Cumulative)
Jan. Feb. Mar. Apr. May Jun. Jul. Aug. Sep. Oct.




Operating Revenues-1942
Operating Revenues-1929
Nevertheless, Gross Revenues Rose And —
Operating Revenues-1939
Millions of Dollars
Monthly Totals (Non-Cumulative)
Jan. Feb. Mar. Apr. May Jun. Jul. Aug. Sep. Oct.


Increased Efficiency Brought Larger Net Earnings
Net Ry. Operating Income-1942
Net Ry. Operating Income-1929
Net Ry. Operating Income-1939
Millions of Dollars
Monthly Totals (Non-Cumulative)
Jan. Feb. Mar. Apr. May Jun. Jul. Aug. Sep. Oct.

probably have attained naturally, if the country had been spared the social experiments of the last decade. The railroads have shown that, with national income and production at such a level, they are not an "over-expanded" industry—since the country needs all the facilities they have, and then some. They have also shown that, at such a level of production and traffic, they can make better net earnings than ever before in history.

The future of the industry, therefore, lies largely in the realm of politics. Given political conditions favorable to large national production and income, and reasonable freedom from persecution, the latent health and strength of the industry will be infallibly demonstrated.

Where Earnings Increase Is Greatest

Of course, the increase in earnings of the past year has not been uniform. Some roads and some sections have seen greater activity than others. Of the 49 systems designated by the Interstate Commerce Commission as "large steam railroads," 13 had gross revenues in the first 10 months of the current year which were 100 per cent or more above those of 1939. Of the railroads in this category of largest increase, four are lines serving the Pacific Coast, three are Southern lines, and three of them are in the Southwest. Only one Eastern railroad is in this highest category, and it does not reach the Atlantic seaboard. The two remaining roads showing the highest increase are carriers prominently identified with the steel industry.

Sixteen of the "large steam railroads" had increases in gross revenues between 75 and 100 per cent—the first 10 months of 1942 compared with 1939. Of these, seven are Eastern lines, three are in the mid-West, two are in the South, three are in the Southwest, with one line reaching the Pacific Northwest making up the total. Of the fourteen railroads with increase in gross revenue ranging between 50 and 75 per cent, one is in the Mid-West, two extend into the Pacific Northwest, two lie in the Pocahontas region, one is a Southern line, four are granger roads, and four are in the East.

Of the 49 "large" railroads, 33 had more gross revenue in the first ten months of 1942 than they had in the same period of 1929, and 16 had less. Five of them had gross revenues 50 per cent or more above those of the equivalent 1929 period. Two of the five are carriers which reach the Pacific Coast, one is a Southern road, one is in the Southwest and one is in the Great Lakes region.

Suburban Traffic Not Remunerative

In general, a road-by-road examination of the figures, shown in an accompanying table, bears out the generalization that it is the lines to the Pacific Coast which have had the greatest increase in revenues, with some of the Southern and Southwestern lines showing just about the same ratio of increase. The Eastern lines and the granger roads, by comparison, have had a comparatively lighter burden put upon them. At the bottom of the list in increased revenues stands the Long Island, the discrepancy in its fortunes being most conspicuous when 1942 net railway operating income is compared with that of 1929. The situation of this road gives point to the valiant fight it is making to secure public understanding of the peculiar problems faced by a predominantly passenger line in these days of highly developed competition from subsidized sources.

Procurement of Materials

(Continued from page 48)

rate of production, keeping both schedules and materials in step.

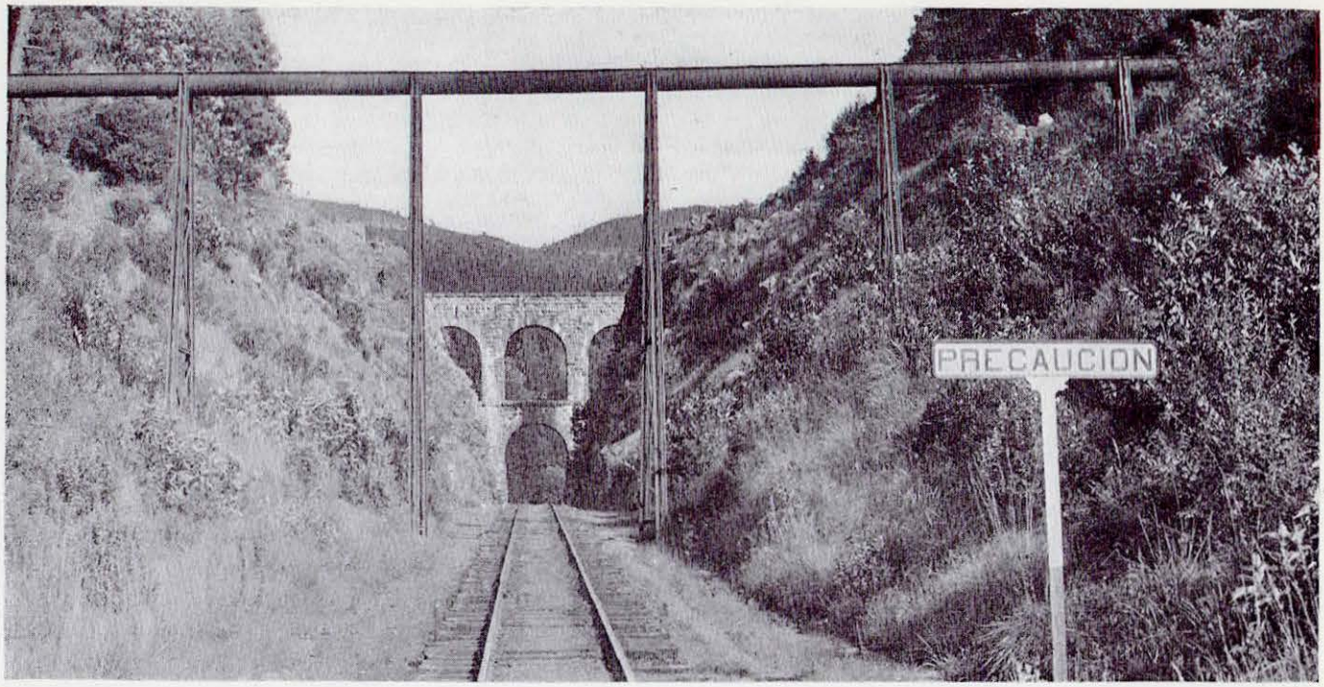
The organization centers around several so-called claimant agencies, consisting of the Army, the Navy, the Maritime Commission, the Lend-Lease Administration and other war agencies and the Office of Civilian Supply. Additional claimant agencies, including ODT, were designated in December, thus taking the transportation industry out from under the wing of the Office of Civilian Supply.

The directors form the Requirements Committee. The chairman makes all decisions after examining the requirements presented by the Claimant Agencies. The decisions are expressed in terms of total tonnages of controlled materials which are allotted to Claimant Agencies for (1) production programs, (2) construction, and (3) maintenance, repairs and operating supplies, to be referred to in the future by WPB as operating supplies. With civilian supply and indirect military requirements, the allotment is made to the Agency but the allotments will be distributed through procedures administered by the industry divisions. Thus the industry division will be the contact for the distribution of materials to almost all producers of other than specified items purchased directly by the Army, Navy and Maritime Commission.

The railroads have been notified that they must conform to the plan and, at this writing, were expected to prepare by January 15 detailed bills of material of their requirements of controlled and related materials for the second quarter of the year, which will require them to obtain details from their sources of supply about the weight of each kind of material which is required in making the railway materials. These bills of material must then be submitted to the Transportation Equipment division of WPB for consolidating the requirements of the railroads preliminary to over-all allocations to Claimant Agencies, after which the requirements of individual railroads will be readjusted to conform.

In a recent discussion of the plan, J. T. Ryerson, chairman of Inland Steel Company, said the plan was substantially the plan proposed by steel producers to solve the problem in material distribution. Gen. T. S. Hammond, chief of the Chicago Ordnance District, referred to the plan as the last chance to improve war production and concluded that it must be made to work. Donald Nelson said that the plan will insure railroads getting their proper proportion of materials essential to do their job. Leon Henderson, director of civilian supply, stated that the more essential civilian products, including railroad equipment and materials, will get relatively larger allotments of the controlled scarce materials. The plan with its new verbiage is puzzling manufacturers who have undertaken to interpret it. Like any other plan devised primarily for manufacturing, it will require revisions before it will fit the railroads. Adjustments have already been made since the plan was announced. In neither the CMP plan, as outlined, nor the organization does it appear that the railroads will be any better represented within WPB than previously.

Meanwhile, the railroads need steel, ties and lumber, as well as new locomotives and cars, and they need materials not in starts and spurts but with regularity. As the country enters the second year of the war, it increasingly appears, therefore, that the railroads must keep before them the fact that they will have to press firmly and constantly for their needs.



A View on the Laredo-Mexico City Main Line Near Queretaro.

Mexican Railways Change Officers

Experienced railway men now head the national transportation system of our southern neighbor

By Our Mexican Correspondent

AFTER replacing the ineffective Workers Administration by government control in 1941, the prolonged illness and death of General Enrique Estrada, formerly general manager of the National Railways of Mexico, induced President Avila Camacho to appoint experienced railway officers to take over the management. Accordingly, Margarito Ramirez was appointed general manager and J. J. Franco returned to his former post as general superintendent of transportation.

The year was marked by a sizeable increase in traffic and earnings, by the inauguration of a rehabilitation program of the main lines undertaken by the government of the United States in collaboration with the Mexican government and by a 10 per cent increase in salary granted to employees. The new measures and policies have been undertaken with a view of increasing the effectiveness of the Mexican railways in promoting the war effort. The properties of the National lines have not been maintained to the extent that would enable them to handle prospective traffic efficiently, but it is expected that the rehabilitation program now under way will bring the lines to a degree of physical soundness that will permit the more efficient operation necessary under war conditions.

The curtailment of ocean and gulf shipping will mean heavier traffic for the Mexican railways and the American and Mexican governments have entered into an agreement whereby the former will assist in the rehabilitation of certain important lines. These include the Laredo-Mexico City, the Monterrey-Torreon, and the Chihuahua-Torreon lines, as well as the Cordoba-Puerto Mexico line and its continuation to Suchiate on the Guatemalan border. The U. S. will pay for the materials and equipment which are considered necessary to put the lines in shape.

A staff of U. S. railway experts is already at work in Mexico, studying transportation, maintenance of way and mechanical department problems involved in this rehabilitation. They are making careful inspections of the track, shops, rolling stock and other equipment and will prepare a report for the approval of the management of the N. R. M., after which active work will be begun at once. While the materials will come from the United States, the work will be carried out directly under the management of the Mexican lines and with Mexican labor and all rolling stock will be repaired in Mexican car and locomotive shops.

Operating Results for Eight Months

Gross earnings have been climbing continuously for several years, the peak having been reached in 1942, with earnings continuing to follow an upward trend and thereby keeping the operating ratio below the figure of 85 per

NOTE: All monetary figures shown are quoted in Mexican currency, with the Mexican peso (dollar) quoted at approximately 20 cents, American money.

cent fixed by the federal government as the maximum, as provided for in the presidential decree which again placed the National Railways of Mexico under government control in February, 1941. Gross operating revenues during the first eight months of 1942 were $128,527,381, as compared with $112,805,154 in the same period of 1941, an increase of 14 per cent. Freight earnings increased from $79,940,997 to $90,913,660; passenger earnings increased from $20,191,559 to $22,163,851; express revenues increased from $9,144,841 to $10,946,607; baggage earnings increased from $84,604 to $84,886; miscellaneous earnings increased from $3,424,979 to $4,399,871. Telegraph earnings remained practically the same, the increase was from $18,174 to $18,508. There was also an increase in earnings other than operating from $2,075,516 to $2,614,696, the major portion of which pertains to rental of equipment.

Operating expenses amounted to $94,204,129 during the first eight months of 1941, while during the same period of 1942, they were $110,017,772, an increase of $15,813,643, or 16 per cent. This difference was caused by increases reported by all the departments, because of a greater volume of traffic handled, higher prices of materials and a 10 per cent raise in salaries. Transportation department expenses increased from $39,179,736 to $45,309,675 (15 per cent), the greater portion of which resulted from pay increases; motive power and machinery department expenses increased from $28,600,823 to $34,081,901, or 19 per cent; maintenance of way department expenses increased from $15,004,215 to $16,330,549 (8 per cent); express department expenses increased from $4,046,050 to $4,803,588 (18 per cent), and miscellaneous expenses increased from $41,778 to $154,687, or 270 per cent.

The fact that the operating expenses increased in a greater ratio (16 per cent), than operating earnings, (13 per cent), increased the operating ratio from 82 per cent in the first eight months of 1941 to 83.8 per cent in the same period of 1942. Other expenses increased from $4,649,553 to $7,714,481 (65.9 per cent), the major part of which was due to the increase in per diem payments, as a larger number of foreign cars were required to handle the increase in traffic. The higher ratio of the increase in the total railroad income and the total railroad disbursements brought about a decrease from $16,026,987 to $13,409,824 in net railroad earnings (16 per cent).

Operating Statistics Reflect Rehabilitation Need

The accompanying table shows a selection of comparative operating statistics of the National Railways of Mexico (excluding the Interoceanic Railroad, which is administered by the National Lines under contract) for the first 10 months of 1941 and 1942. Net freight ton-kilometers increased from 366 to 394, indicative of heavier trainloading, the average load per car having increased from 26.1 to 27.2 tons. The increase in gross tons handled per train-kilometer from 818 to 852 produced a consequent increase in utilization of tractive power, which rose from 74.2 to 76.5 per cent. The decrease from 62 to 57.1 train kilometers per car day denotes delays of cars at terminals and on the road, because of a shortage of power. Notwithstanding this unfavorable situation, the percentage of loaded car kilometers to the total increased from 67.4 to 69.1.

The number of revenue tons handled in car loads increased from 4,660,478 in the first six months of 1941 to 5,167,036 in the same period of 1942 (excluding government shipments and materials for other railways). Revenue ton-kilometers increased from 2,251,138,383 to 2,614,260,344, handled in 376,762 loaded cars, representing an increase of 14,317 loaded cars. Carload freight revenue therefore increased from $52,517,518 to $60,552,249 in the six months period. While gross ton kilometers per train show an increase, the increase of train hours on road was greater, thereby decreasing the gross ton kilometers per train hour from 19,046 to 18,382, the freight train speed having decreased from 23.3 to 21.6 kilometers per hour. This decrease in efficiency was caused by bad track conditions and the comparatively bad condition of tractive power and rolling stock.

Selected Operating Statistics

First 10 Months of 1942-1941

	1942	1941	Inc. or Dec.	% Change
Locomotive klms. (total)	32,627,238	31,198,127	+1,429,111	4.6
Freight train klms.	13,717,028	13,016,815	+700,213	5.4
Passenger train klms.	8,828,323	8,917,810	−89,487	1.0
Mixed & Specl. klms.	3,103,711	3,051,897	+51,814	1.7
Non-revenue klms.	107,907	62,801	+45,106	71.8
Total train klms.	25,756,969	25,049,323	+707,646	2.8
Passenger car klms.	69,225,261	67,804,618	+1,420,643	2.1
Freight loaded klms.	208,788,725	190,073,319	+18,073,406	9.5
Freight empty klms.	93,317,760	92,128,606	+1,189,154	1.3
Freight total klms.	302,106,485	282,843,925	+19,262,560	6.8
Net-ton klms. (1,000s)	5,678,253	5,007,532	+670,721	13.4
Gross ton klms.	12,857,994	11,740,080	+1,117,914	9.5
Total No. cars loaded	417,980	397,438	+20,542	5.2
Averages				
Net tons per train klms.	394	366	+28	7.7
Gross tons per train klms.	852	818	+34	4.2
Speed per hr. (klms.) frt.	21.6	23.3	−1.7	7.3
Gross ton klms. per train hour	18,382	19,046	−664	3.5
Utilization of tractive power	76.5%	74.2%	+2.2%	3.0
Frt. Loco. klms. (daily)	185	185	....	..
Liters oil per 1,000 G. T. K. (frt.)	41.9	42.6	−0.7	1.6
Per cent loaded car klms. to total	69.1	67.4	+1.7	2.5
Car klms. per car (daily)	57.1	62.0	+4.9	7.9
Net tons per car	27.2	26.1	+1.1	4.2
Cars on line daily	17,389	15,018	+2,371	15.8
Klms. line operated	11,765	11,639	+126	1.1

Labor and Material Costs Rise

The increased prices of materials and the 10 per cent increase in salaries allowed shop personnel in March, 1942, are reflected in the costs of repairs to coaches, cars and locomotives as follows: for 12 months ending September, 1942, as compared with the same period of 1941, labor charges for repairs to coaches rose from $25.90 to $26.29, or 1.5 per cent, per 1,000 kilometers run, and material costs jumped from $15.85 to $17.75 (11.9 per cent), with a total combined increase from $41.75 to $44.02, equivalent to 5.4 per cent. Repairs to freight cars show an increase from $20.72 to $24.19 for labor, or 16.7 per cent, and materials increased from $22.45 to $28.42 per 1,000 kilometers run, or 26.6 per cent. The combined increase in the cost of repairs to cars rose from $43.17 to $52.61, equivalent to 21.9 per cent. Backshop labor repairs to locomotives rose from $231.08 to $285.16, or 23.4 per cent, and material costs increased from 154.16 to $204.18 (32.3 per cent); as a result, the combined cost per 1,000 kilometers run increased from $385.54 to $489.31, equivalent to 26.9 per cent. Running locomotive repairs also increased as follows: labor, from $179.63 to $224.76 (25.1 per cent); materials, from $40.95 to $57.19, or 39.7 per cent, and the total cost from $220.58 to $281.95, or 27.8 per cent.

The Motive Power and Car Situation

The constantly increasing freight and passenger traffic has demanded the use of additional American cars on a per diem basis, to the extent that from 4,000 to 5,000

foreign cars, besides the cars owned by the mining companies and Petroleos Mexicanos, are held on line daily, which has increased per diem payments from about 4,000,000 in the first eight months of 1941 to $7,000,000 in the same period of 1942. The National Railways of Mexico contracted for and obtained 1,000 new steel box cars from the United States, and they have helped to a certain extent, but a betterment in the car situation only does not solve the problem, notwithstanding the fact that the capacity of the cars has been better utilized, increasing from 26.1 to 27.2 tons per car-kilometer.

The lack of motive power, and the bad conditions of the locomotives available, which cause failures and delays on road, have been quite a problem on the Mexican Railways, and much more so because new locomotives cannot now be purchased in the United States because of war conditions. However, the National Railways have bought 71 locomotives from American railways and equipment dealers in the United States, 26 of which have already been received. The locomotives already delivered to the Mexican Lines were sold at a price of $3,198,575, besides the cost of repairing them in the United States before delivery. Active arrangements are being made with the American government to obtain license permits for locomotives due.

Fuel Consumption Increases

The National Railways of Mexico utilize fuel oil in locomotives for all services, and the few coal burners that were still in use are now being converted into oil burners. The cost of fuel oil and the explanation of fuel oil consumption by locomotives for the first eight months of 1942 and 1941 were as follows:

	1942	1941	Increase	%
Passenger service	$1,820,611	1,682,345	138,266	8.22
Freight service	4,449,999	4,103,514	346,485	8.44
Mixed train service	699,451	655,300	44,151	6.74
Total cost	$6,970,061	6,441,159	528,902	8.21

Origin of the Increases

	Passenger	Freight	Mixed	Total
Increase in tonnage	+$15,309	+372,414	+39,337	+427,060
Increase in prices	+14,421	+45,742	+5,674	+65,837
Other reasons	+108,535	−71,670	−860	+36,005
Totals	+$138,265	+346,486	+44,151	+528,902

The National Railways personnel, after discussing the matter at length, obtained a 10 per cent increase in salaries, which means a monthly increase of $700,000 in operating expenses. The total increase during the first eight months of 1942 amounted to $10,897,718 for all compensation to personnel, as compared with the same period of 1941, but the difference also represents the additional workers required to handle the considerable increase in freight and passenger traffic. The total compensation, including salaries, overtime pay, sick and vacation pay; road expenses, etc., amounted to $76,804,731 in 1942, as compared with $65,907,012 in 1941.

Relations between the management and the workers have been more or less normal and no friction of any kind has arisen during the year. The management presented a petition to the Union of Mexican Railroad Workers on December 5, 1942, containing 27 points and requesting certain modifications of the labor contract. Although the union states that it is willing to co-operate fully with the new administration, it states also that the workers will undoubtedly be more willing to co-operate if their labor contracts are not "multilated." The matter has not yet come to a show down and the federal government has taken a hand in the matter, stating that it will do everything possible to convince the union of the necessity of co-operating positively in the present emergency, before deciding to take any drastic measures.

The administration's petitions cover the elimination of the mixed disciplinary commissions and full authority for the officers to apply appropriate discipline; a divided instead of a continuous-hour working day; absolute freedom to appoint officers and men in confidential positions; effective suspensions of workers instead of the demerit mark system; maximum utilization of motive power; non-interference in administrative authority by the union; assignment of vacancies on the basis of efficiency only; re-establishment of doubleheading; re-establishment of the divisional system; cancellation of the obligation to fill vacancies, either temporary or permanent, when not considered necessary; modification of the sick pay clause and readjustment of the number of holidays to a total of six per year. The union has made official statements to the effect that no labor conflict exists between its members and the National Railways of Mexico; that relations with the federal government and the present management are most cordial, and that they will discuss the petition of the railroads in friendly terms and co-operate fully with the policies of the Mexican government.

Freight Transported by Group Classification
First Six Months

	Tons		Revenues	
	1942	1941	1942	1941
Forest Products	329,971	318,145	$4,090,514	$3,660,451
Agricultural Products	1,627,511	1,483,268	19,811,006	17,637,834
Animals & Animal Prods.	141,094	140,129	2,363,601	2,212,628
Inorganic Products	2,548,918	2,252,599	23,533,056	20,120,643
General Mdse.	519,542	466,337	10,754,073	8,885,962
Grand total	5,167,036	4,660,478	$60,552,250	$52,517,518
Per cent increase	10.9		15.3	

Export and Import Traffic

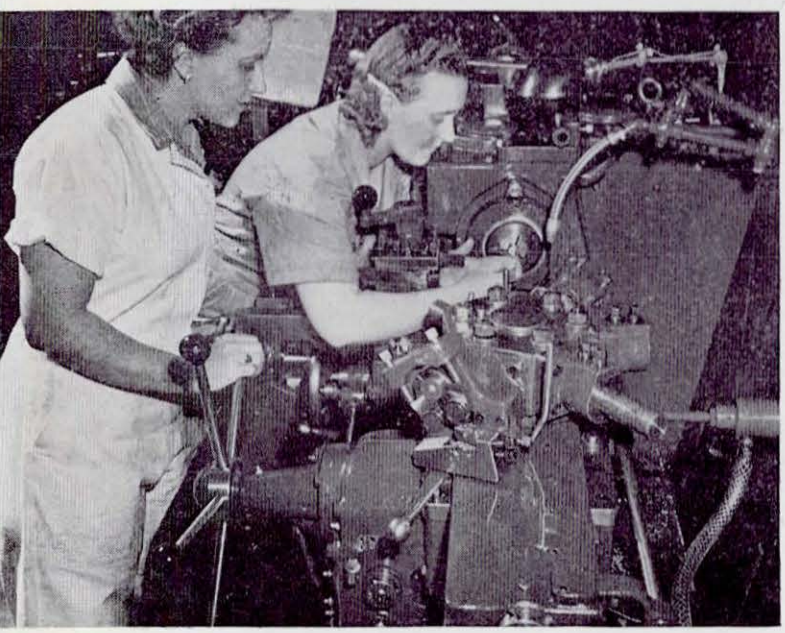
The following statement reflects the situation with regard to export and import traffic for the first ten months of 1942:

Loaded Cars Interchanged
10 Months 1942-1941

	Imports		Exports	
	1942	1941	1942	1941
Laredo	13,846	10,060	11,582	6,905
El Paso	2,833	2,416	7,818	6,792
Eagle Pass	1,999	1,461	2,149	1,606
Brownsville	600	423	1,937	299
Totals	19,278	14,360	23,486	15,602
	Water Ports			
Tampico	546	1,846	1,301	4,151
Veracruz	1,442	2,175	1,828	3,231
Manzanillo	310	1,794	39	.....
Totals	2,298	5,815	3,168	7,382

While both imports and exports increased through American boundary ports, it will be noticed that imports increased 4,918 cars and exports increased 7,884 cars during the last 10 months of 1942, as compared with the same period of 1941. The major portion of the increase in exports is attributable to larger shipments of minerals and raw materials to be used in the war industries as a part of Mexico's contribution to the war effort.

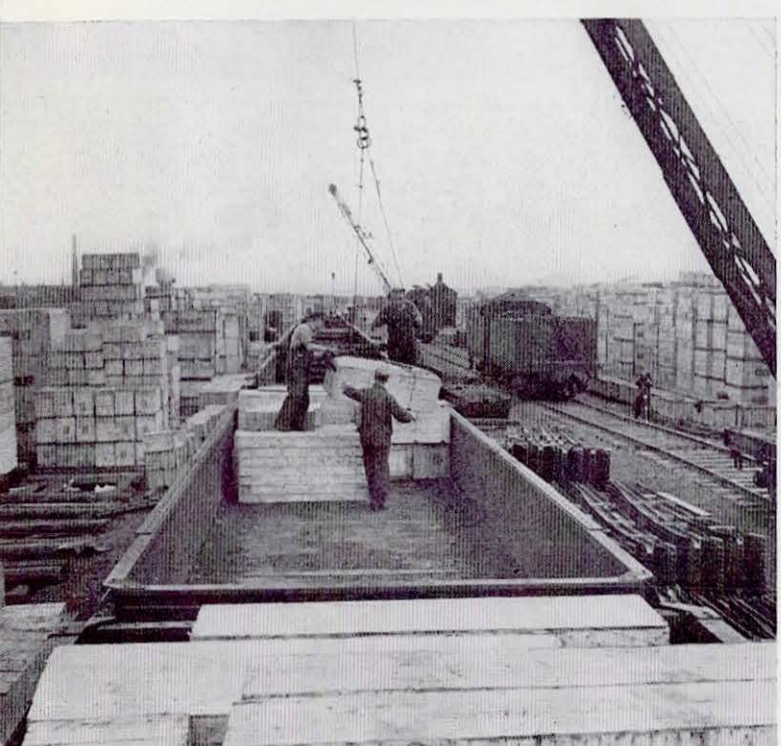
Imports and exports through water ports decreased considerably because of the submarine campaign, which diverted outbound and incoming movements via rail to and from Mexico and Central America. A considerable increase is expected in the future in overland imports and exports, when the National Railways of Mexico have been rehabilitated in accordance with the work program agreed to by the United States and Mexican governments.

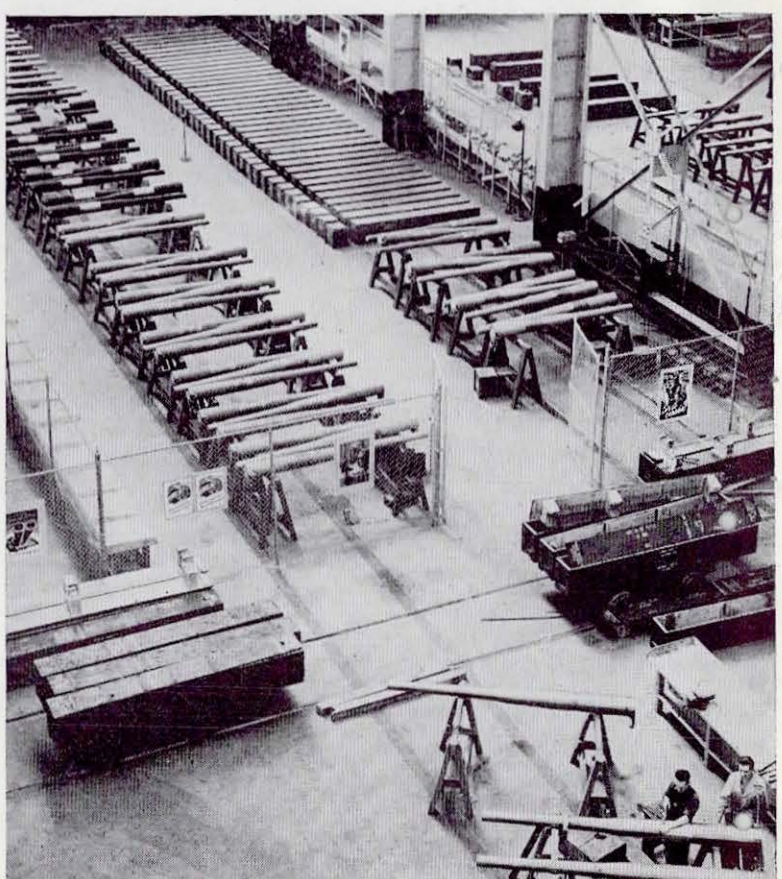


The Canadian Railways at War

LEFT: Boarding a Troop Special at Debert, N. S.; Women Employees on Munitions Work by a C. N. R. Subsidiary; War Industry Products at an Assembly and Forwarding Yard. TOP: Canadian-Made Tanks en Route "Over There". BOTTOM: 12-Pounder, Rapid-Fire Naval Guns on the Assembly Line in a Railway-Operated Munitions Plant

All Photos Courtesy C. N. R.





Canada's Railways Are Carrying On

Unprecedented traffic, both freight and passenger, moved with less equipment and staff, while railways do other important war work and release men for armed services

By Railway Age's Correspondent at Ottawa

A STEADY increase in freight and passenger traffic with a relentless tightening in available facilities—both manpower and equipment—is the picture of the Canadian railways' performance in the calendar year 1942. It was a profitable year for both the Canadian Pacific and the Canadian National. Estimates made considerably in advance of the time when the year's books will be closed indicate that the Canadian National will have an operating net of $85,000,000 (in 1941, it was $66,600,000), which means it will for the second successive year more than earn the interest on its obligations in the hands of the public, while it is forecast that the Canadian Pacific will have net operating revenue of $48,000,000.

Materials Allocators Are Co-operative

Relations between the railways and the many war agencies—including Canada's equivalents of WPB and OPA—have been harmonious and mutually advantageous. This may be difficult to believe in the United States—where, up here in Ottawa, one gets the impression that some of the war agencies have a rather limited comprehension of the problems and importance of the railways. However, here in Canada a larger ratio of the national economy is engaged in the making of munitions, the movement of armed forces and the moving of war equipment than in the United States. The railways bear a larger ratio to total industry than in the United States—and since the beginning of the war the Dominion government, in its many controls over the economy, has continuously rated the railways, in priorities and otherwise, in close measure to their relative importance.

How Canada's Freight Traffic Has Grown During the War

Revenue Ton-Miles (Millions)

	Canadian National	Canadian Pacific
First 10 months, 1942	26,126	18,718
First 10 months, 1941	22,337	18,209
First 10 months, 1940	17,449	12,991
First 10 months, 1939	13,528	11,284

It need only be recalled that C. D. Howe, Canada's Munitions Minister (responsible for the functions exercised by the WPB in the United States), was formerly Minister of Transport—to understand why railway requirements have been so fully appreciated in the top circles of Canada's war administration. "Our policy has been and will continue to be while the war lasts," said Mr. Howe the other day, "to see that the railways get all the equipment they really need to handle the vastly increased traffic, but because the steel situation, particularly, is still tight, we cannot afford to let the railways have all the new equipment and supplies which they declare they want."

It is not likely that there will be trouble in keeping the railways adequately equipped. "Fancy stuff" won't be available, but actual necessities will be met. Such at least is Mr. Howe's assurance, and considering his knowledge of actual conditions, great reliance can be placed in his statement.

Freight Traffic Up 88 Per cent

Final traffic estimates for the year 1942 on the Canadian National System indicate a total of 32,014,000,000 revenue ton-miles and 2,645,000,000 passenger-miles. This is an increase in freight traffic of approximately 39 per cent over 1928 (Canada's biggest pre-depression year). It is an increase of 88 per cent over 1939, the the first year of the war. The increase in passenger traffic is 72 per cent over 1928 and 200 percent over 1939. New equipment received by the government system during the year amounted to 70 locomotives, 1,040 freight cars and 46 passenger cars. Operating revenues for the Canadian National for 1942 are estimated at $370,000,000, operating expenses at $285,000,000, and operating net $85,000,000. Operating revenues in 1941 were 304 millions and operating expenses were 238 millions.

The number of personnel lost by the Canadian National as the direct or indirect result of the war is not easy to calculate but it is known that over 10,000 of the employees of that railway are in the armed services, or approximately 10 per cent of the total working force.

Freight traffic on the Canadian Pacific for the calendar year 1942 is estimated to be 24,560,000,000 ton-miles, a slight increase over 1941. It will be recalled that, while Canada this fall harvested the largest grain crop in its history, the movement of that crop has been deferred, most of it being stored in the elevators and on the farms. The freight tonnage of the two roads would have been much higher for 1942 had the usual proportion of the crop been moved at the usual time. Passenger mileage on the Canadian Pacific in 1942 was estimated to be 2,072,000,000, as compared with 1,313,000,000 in 1941.

Many Railwaymen in Armed Services

New equipment added by the Canadian Pacific during the year included over 20 Pacific type locomotives, 25 passenger cars, 100 refrigerators, 150 70-ton ore cars, 150 40-ton automobile cars and 30 cabooses. A total of 15,130 of Canadian Pacific personnel had been taken directly or indirectly by the war as of December 1, 1942. Of these 13,597 were in active service, 1,376 in the reserve army, and 157 are on loan to war industries. The Canadian Pacific was able to purchase 53,788 gross tons

of steel rail during the year—3,200 tons being bought in the United States for use in Maine and Vermont.

Gross revenue of the Canadian Pacific for 1942 is estimated at $194,109,000 from freight and $38,272,000 from passenger traffic. With the addition of $23,160,000 as revenue from other sources the estimated total gross revenue of the Canadian Pacific for 1942 is $255,541,000, with an estimated operating net of about $48,000,000.

A Few New Passenger Cars

Mr. Howe has made it plain that new passenger cars, excepting where imperatively needed, are "out" for the duration. There have been exceptions—such as special cafeteria cars on both roads to help feed the tremendously increased number of passengers. In the year just closed the amazing rise in war traffic on the roads was more notable, even, than in 1941. More trains were run in two and three sections than in 1941, which meant longer hours for crews and greater difficulty in getting sufficient time and personnel for terminal handling. In 1942 section gangs had to cover more mileage than 1941. Throughout the business of both the Canadian Pacific and the Canadian National, it was a year of more work and less people to do it.

Near the end of the year it was announced by the Canadian National that next spring or early summer the new and long delayed Montreal passenger terminal would be open for traffic. The "hole in the center of the city" is finally to become a facility instead of a project. Its aggregate cost is probably over $25,000,000. The terminal was begun late in the regime of Sir Henry Thornton, was continued for a short time during the period when R. B. Bennett was Prime Minister and then discontinued until the present Mackenzie King administration returned to power in 1935. Then it was resumed and now is being rushed to completion with all the difficulties of getting adequate materials and manpower.

Revenue carloadings for the year 1942 totaled about 3,370,000, as compared with an actual total in 1941 of 3,189,447, but, as already indicated, there would have been a much more substantial increase had a considerable part of the Western grain crop been moved, instead of being stored.

There is the usual discussion in some quarters about this being the best time to devise some scheme for a more durable solution of Canada's perennial railway problem. The problem, it is insisted, is still here even though it has been obscured temporarily by abnormal war traffic. Most qualified observers are persuaded that when demobilization comes, no matter how much the nation is cushioned against the shock, the railways will feel the pinch severely. Long-range planning for the post-war period by and for the railways is believed necessary if the railways in this country are to continue to function efficiently for the "long pull."

Penury Developed Ingenuity

In his year-end summary statement to the press, C. P. R. President D. C. Coleman drew attention to the unprecedented contribution of Canada's railways to the war program during 1942, despite "marked shortages of material and labor." The difficult period before the outbreak of the war had called upon the railways for "drastic methods of operating economy," he pointed out, and the result was that "railway operation came through streamlined and energized to a degree that had not previously been reached"—all of which provided "an excellent starting point from which to attack the tremendous problems in transportation which the present war was to bring."

President Coleman also mentioned the C. P. R.'s large contributions to the war program in addition to the provision of railway transportation. Its great fleet of steamships have been a part of the British navy since the beginning of the war, and eight of them have been sunk. C. P. R. shops are building tanks and guns. Of the railway's total force of 70,000, more than 15,000 are on leave with seniority and pension rights protected, either in the armed services or otherwise engaged in war work. The C. P. R. also is maintaining on a non-profit basis five air observation schools and one elementary flying training school.

Railways Necessary to Effective War

"One of the many lessons which this war so far has driven home," Mr. Coleman went on to say, "is that while the railways are a fundamental necessity in time of peace, in times of national danger they are a mainstay of front line defense." He related how Hitler had overlooked this truth; "he starved the railroad and latterly has been forced to give the construction and repair of locomotives and rolling stock priorities as high as tanks, airplanes and U-boats."

"It has become inescapably clear," he continued to say, "that a country's railroads are still the main actuating force of its industrial effort, and that when that force is allowed to become weak or inefficient no other transportation agency can adequately take its place."

After reviewing the traffic and revenue figures for 1942 in comparison with earlier years, C. N. R. President R. C. Vaughan in his year-end statement drew attention to some figures on improved efficiency of operation. Traffic volume in 1942 exceeded that of 1928, he said, by 44 per cent—but this increase was handled with 8.6 per cent fewer employees, 26 per cent fewer freight cars, 14 per cent fewer passenger cars and 6 per cent fewer locomotives. Fuel consumption in 1942 was 45,000 tons less than in 1928.

Other Jobs for the War Program

The C. N. R., he revealed, is handling 20,000 war workers daily to seven factories, where other means of local transportation were not available. In its shops the C. N. R. is producing munitions—"guns, gun carriages and several secret devices." Minesweepers, corvettes and merchant ships are being built in the company's shipyards. Canadian National steamships have been converted to armed cruisers and others are being used as supply vessels for the armed forces—not without casualties. Many of the company's staff have been loaned to the government for war work requiring specialized knowledge.

In Mr. Coleman's statement, he indicated some misgivings about control of wages and prices—they have not avoided "steadily rising costs of operation" for the railways. While post-war problems will be many and serious, Mr. Coleman points out the many new resources which the necessities of war have developed in Canada. He believes that under wise direction, the diversion to peace-time use of these resources should prevent widespread unemployment. He expects also that the post-war period may attract desirable settlers to Canada from war-torn Europe, and hopes "there will be no raising of barriers to prevent their entry."

1942 Railway Operations Reviewed

Both freight and passenger traffic surpass all previous records —This was made possible by improved operating efficiency despite inadequate equipment and manpower

By Dr. Julius H. Parmelee

Director, Bureau of Railway Economics
Association of American Railroads

WAR, in its myriad manifestations, continued throughout 1942 to absorb the activities of the American people, and of every individual. Transportation represents one of the most important of those activities. During this first complete year of direct participation by the United States in the present world conflict, many outstanding developments affected the railways, their traffic, their plant, and their personnel.

So many and so powerful were the impacts of war economy on transportation that to record them within small compass is not easy. Only the most striking developments can and will be noted.

Perhaps the most notable development of the year, from the point of view of the railroads as the principal agency of American domestic transport, was the greatly increased demand for transportation service by rail, in both the freight and passenger fields. Some of the reasons for these increases will shortly be outlined. It suffices here to emphasize that both rail freight and rail passenger traffic in 1942 outran all previous records by wide margins. The volume of freight traffic in 1942 was greater than in 1939 by 89 per cent, and greater than in 1929 (the prewar peak) by 41 per cent, while the volume of passenger traffic in 1942 was greater than in 1939 by 134 per cent, and greater than in 1920 (the prewar peak) by 13 per cent. When these rapid upward trends are considered, some realization of the tremendous impact of war on the railroads emerges.

Underlying reasons for these sharp increases in freight and passenger traffic to new high levels are not far to seek. In the freight field, rail traffic growing out of the production of such basic materials as coal, iron ore, iron and steel products, and other heavy commodities supplied a large part of the increase. Superimposed on this foundation was the addition to normal movement of many special movements that resulted from certain unusual conditions, some or all of which will disappear after the war. These movements include long-distance haulage by rail of lumber from the west, coal to New England, petroleum into the Eastern District, southern imports to the north and east, and many others. In addition, our two-ocean war has stimulated long hauls to seaports on both coasts. Gasoline and rubber shortages, and the diversion of shipping from their ordinary routes, have also played a significant part.

A most striking traffic development during the year was the increased rail movement of petroleum by tank car into the 17 states of the Eastern District. The average movement for the year 1942 as a whole—including a comparatively small weekly performance up to May—was 620,000 barrels per day. Starting with less than 100,000 barrels per day in January, the volume increased quite steadily until (week of September 19) it reached a peak for the year of 856,710 barrels per day. This was at the rate of 6,000,000 barrels, or 252,000,000 gallons, per week.

Rail movement of anthracite coal into New England in 1942 increased 10 per cent over 1941, while that of bituminous coal—a much greater volume—increased more than 60 per cent.

As to lumber, total national production during the first ten months of the year 1942 showed a decrease of 5 per cent, whereas carload shipments of forest products by rail increased nearly 12 per cent. This indicates, in a general way, the growing relative importance of rail movement of lumber and its products.

Average Trainloads Increased

As will be detailed later, the railways in 1942 operated at high levels of efficiency. No single item of efficiency stood out more strikingly than the increase in average trainload—both freight and passenger. The freight trainload, which in 1939 broke a 10-year record, increased again in 1940 and 1941, and still again in 1942, to 1,030 tons. Passenger-train occupancy, which in 1939 averaged 58, increased steadily to 115 in 1942, also a new record. Other factors that attained record levels were ton-miles per freight-train hour, average freight carload, car-miles per freight car-day, and the daily mileage run by both freight and passenger locomotives.

Railway gross and net earnings showed considerable improvement in 1942. Complete statistics are not available at this writing, but it is clear that financial results for the year will be better than at any time since 1929. However, as the carriers pointed out to the Interstate Commerce Commission in their reply of December 15 in Ex Parte 148 proceedings, one year supplies no basis for assuming a continuance of similar trends, the rate of return on investment was less than 6 per cent, and the prospects are for heavier tax payments and higher operating costs in 1943. It seems reasonable to believe that the financial story for 1942, when available, will be much more favorable than it will be in 1943, even assuming some increase in traffic next year.

Near the close of 1941, the President, by executive order, set up the Office of Defense Transportation (ODT). This agency was directed to "assure maximum utilization of the domestic transportation facilities of the Nation for the successful prosecution of the

war." Domestic transportation as defined in the order includes railroad, motor, inland waterway, pipe line, air transport, and coastwise and intercoastal shipping. Joseph B. Eastman, Chairman of the Interstate Commerce Commission, was named Director. The ODT assumed the duties formerly vested in the Transportation Division of the Advisory Commission to the Council of National Defense.

Some of the principal functions of ODT include (1) coordination of the transportation policies and activities of Federal agencies and private transportation groups; (2) estimating the requirements likely to be imposed upon transport facilities by the war effort; (3) coordination and direction of traffic movements to avoid congestion; (4) development of measures designed to secure maximum use of existing transportation facilities; (5) stimulation of provision of needed additional facilities; (6) advising the War Production Board as to estimated requirements of materials and equipment necessary for the provision of adequate transport service; (7) determination of storage and warehouse requirements. Additional functions and powers were conferred by a subsequent Executive Order, dated May 2, 1942, which placed "all rubber-borne transportation facilities," including passenger cars, buses, taxicabs, and trucks, under ODT control.

The Office of Defense Transportation, as originally set up and expanded from time to time, comprises the following divisions—railway transport, motor transport, local transport, inland waterway transport, coastal and intercoastal transport, Great Lakes carriers, petroleum and other liquid transport, transport conservation, traffic movement, rates, transport personnel, storage, and a section of materials and equipment.

Creation of the Office of Defense Transportation has constituted the government's primary approach to the vital question of adequate wartime transportation. The agency does not manage or operate the carriers, but facilitates and expedites measures necessary to the effective functioning of transport. Its jurisdiction extends to intrastate as well as to interstate commerce, and its powers cover not only common and contract carriers, but also private transportation. Obviously, many prerogatives of private management have been sharply curtailed.

Important General Orders

The impact of this emergency war agency upon the country's transportation activities was immediate and pronounced. ODT action is implemented partly through the exercise of co-operative and suggestive practices, and partly through issuance of general and special orders. To the close of the year 1942, the ODT had promulgated 26 general orders, in addition to 48 special orders. Some of the important developments resulting from these orders, insofar as they affected railway operations, are summarized below.

General Order No. 1, issued March 24, 1942, provided for minimum weight limits on loadings of l. c. l. cars, beginning at 6 tons on May 1, rising to 8 tons on July 1, and to 10 tons on September 1. Its purpose was, of course, conservation of railroad equipment. According to ODT, average l. c. l. loadings surpassed 10 tons in both September and October. Compared with May, Class I carriers in October handled 20 per cent more tons of l. c. l. freight, in only 4 per cent more cars, and with an increase in average load of 15 per cent.

A further step designed to stimulate more intensive utilization of freight cars was General Order No. 18, which became effective November 1, 1942. This order prohibited railroads from accepting for shipment freight cars not loaded either to their marked load limit or to their full visible capacity. Tank cars, flat cars, and cars containing l. c. l. freight were excluded from the order's provisions.

General Order No. 24, effective October 4, froze all railway passenger schedules in the United States. Special passenger trains, new trains, and extra sections which had not been run at least 20 per cent of the time during the preceding 90 days, were prohibited.

Other general orders made the movement of loaded tank cars subject to ODT permit; prohibited railroad transport or handling of coal destined for Lake Erie transshipment; forbade substitution of buses for vehicles heretofore operated on rails; imposed on railroads the duty of removing from United States ports any freight cargo which might interfere with the movement of troops or war materials, when ordered so to do by ODT.

The personnel of ODT was reported at more than 800 in June, 1942, and was expected to increase to more than 1,800 in 1943. Total appropriations for the agency, for the fiscal year 1943, amount to $12,507,000.

One of the important functions of the Office of Defense Transportation has been to make estimates of transportation requirements and to recommend to the War Production Board (WPB) what allocations of needed materials and equipment should be made to the various transportation agencies.

During the year the ODT presented programs at various times to WPB, which acted largely upon the recommendations of the Office of Civilian Supply, a division of the WPB, and generally reduced the amounts recommended by ODT. In December, 1942, however, the ODT was designated as a "claimant agency," and will hereafter present directly to the Controlled Materials Board of WPB its recommended requirements for maintenance materials and equipment needed by transportation agencies.

While this new set up does not mean that more materials will be available for civilian needs, which come after the demands of the war agencies for military and naval supplies, it does mean that railroad requirements will be directly presented to WPB by the government agency most thoroughly familiar with the transportation situation. The requirements of the railroads will no longer be a responsibility of the Office of Civilian Supply.

The material and equipment situation and prospects of rail carriers are so vital to their continued efficiency that the next section is devoted to that general question.

Railway Equipment and Material Situation

Shortly after our entry into the war, the railways surveyed their equipment needs and set up a program for new equipment to October 1, 1942. That program, contrasted with actual deliveries of new equipment, follows:

	Total program	Installed October 1, 1941 to October 1, 1942
New locomotives	974	783
New freight cars	113,594	80,874

It is clear that deliveries of new equipment during the twelve months ended October 1, 1942, were less than the program originally laid down by the carriers.

With full appreciation of the need for conserving critical war materials, the railways in July, 1942, submitted a program of minimum requirements for new

equipment for the twelve months ended October 1, 1943. This program was as follows:

	Needs for 12-months October 1, 1942 to October 1, 1943
New locomotives	900
New freight cars (mostly open tops)	80,000

Finally, on November 19, 1942, the War Production Board announced the following allocations of new equipment for the railroads.

New locomotives for construction during the first 6 or 8 months of 1943	386
New open top freight cars for delivery during the first 6 months of 1943	20,000

These authorizations were at a monthly rate considerably lower than the minimum program of the railways.

As to iron and steel for maintenance purposes the railways, for 1942, requested 1,632,000 net tons of new rail; 991,000 net tons of track fastenings, frogs, switches, etc.; and about 1,800,000 net tons of plates, shapes, castings, etc., for other maintenance purposes.

Rail deliveries in 1942 will approximate 1,200,000 net tons. Data are not available as to the quantities of track and other maintenance materials actually delivered, but they will be less than considered necessary by the carriers.

For 1943, railway requirements for maintenance steel are, in their opinion, as follows:

	Net tons
Rail	2,087,000
Track, fastenings, frogs, switches, guard rails, etc.	1,267,000
Other maintenance iron and steel	1,820,000

To date, the War Production Board has authorized the following amounts of steel for maintenance purposes, for delivery during the first quarter of 1943.

	Authorized deliveries for 1st Quarter 1943
Rails	480,000 net tons
Track accessories	288,000 net tons
Repairs to equipment	330,000 net tons

Table I shows the number of units of equipment installed by Class I carriers during each of the six years 1937 to 1942, inclusive. The table includes also the number of units on order at the close of each of these years.

Table I. Equipment Installations

	Installed during year	On order
Steam locomotives:		
1942 (10 months)	258	289
1941	161	258
1940	126	115
1939	100	51
1938	164	30
1937	373	131
Electric and Diesel:		
1942 (10 months)	380	490
1941	472	288
1940	293	91
1939	220	66
1938	118	41
1937	77	30
Freight cars:		
1942 (10 months)	58,346	30,004
1941	80,502	74,897
1940	65,545	35,702
1939	24,528	37,099
1938	18,517	5,080
1937	75,058	7,947

The trend in the equipment situation during the first three years of the war is outlined below for locomotives, for freight cars, and for passenger cars. The statistics relating to locomotives and freight cars will show a remarkable achievement on the part of the railroads, in reducing the percentage of unserviceable locomotives from 19.1 in 1939 to 5.9 per cent in 1942, and the percentage of bad-order freight cars from 11.9 to 2.7 per cent.

Locomotives. During the three-year period from October 1, 1939, to October 1, 1942, railways were unable to maintain their locomotive ownership at the level existing at the beginning of that period. This is indicated in Table II, below.

Table II. Locomotive Ownership

	October 1, 1939	October 1, 1942
Total ownership	42,778	41,506
In or awaiting shop for		
Class repairs	8,177	2,446
Per cent bad-order	19.1	5.9
Number serviceable	34,601	39,060

As the number of new units installed during the three-year period did not equal the number of units retired, the ownership of locomotives on October 1, 1942, totaled only 41,506 units, a decrease of 1,272 locomotives compared with the ownership three years earlier.

Although locomotive ownership was less in 1942 than in 1939, the number of unserviceable locomotives was reduced to such an extent that the number of available serviceable units increased from 34,601 on October 1, 1939 to a total of 39,060 units on October 1, 1942, an increase of 4,459.

Freight Cars. The trend in freight car ownership from October 1, 1939, to October 1, 1942, is shown in Table III.

Table III. Freight Car Ownership

	October 1, 1939	October 1, 1942
Total ownership	1,643,898	1,736,588
Unserviceable	194,890	46,018
Per cent bad-order	11.9	2.7
Number serviceable	1,449,008	1,690,570

Railroad ownership of freight cars, during the three years to October 1, 1942, showed a net increase of 92,690 cars, or 5.6 per cent. However, the number of serviceable cars increased by 241,562 cars, or 16.7 per cent. The much larger increase in serviceable cars resulted from the marked reduction in number and percentage of bad-order cars.

Passenger Cars. The number of passenger-carrying cars owned by railways of Class I and the Pullman Company (exclusive of dining, lounge, baggage, mail, and express cars) as of December 31, 1939, and January 1, 1942, is shown by principal classes in Table IV.

Table IV. Passenger Carrying Cars

	December 31, 1939	January 1, 1942
Coach and coach combination	20,825	20,329
Parlor cars	900	726
Sleeping cars	6,362	6,625
Other	127	78
Total	28,214	27,756
Number air conditioned	11,715	12,787

Including nonpassenger carrying cars, passenger-train cars in service on December 31, 1939, totaled 45,479, but had decreased to 44,956 cars at the beginning of 1942. Sleeping cars had increased in number, but all other classes of passenger equipment—including, unfortunately, coaches—had been reduced.

For the duration of the present war, few if any new

to redeem or pay off existing debt obligations. Table IX shows what has been done recently by 24 large railroad companies, earning about 75 per cent of the total operating revenues of Class I railways. These figures are based upon special reports furnished by the 24 companies in question.

The Competitive Situation

Impact of war upon the country's transportation system wrought far-reaching changes in the competitive situation, many of which are probably temporary in character. The altered complexion of the transportation problem of past years, from one of surplus facilities to one of maximum utilization of existing facilities, which was in evidence in lesser degree a year ago, became still more evident during 1942. Instead of keen competition, the emphasis in 1942 was upon the most effective distribution of traffic among the several agencies. This trend was furthered by the exigencies of war, which for one reason or another transferred large quantities of traffic from one agency to another. Diversion of domestic tankers and cargo vessels to foreign service, and cessation of intercoastal water movement, have resulted in shifting to the rails a large tonnage of petroleum and other products. Shortage of rubber, and the now nation-wide rationing of gasoline, have transferred to railroads much traffic that in the recent past was carried by motor trucks. Other important shifts took place, with respect to both tonnage and the geographical pattern of movement.

The total amount of transportation service rendered in the United States in 1942 far outdistanced all previous records. On a ton-mile basis, all modes of transportation—railroads, water carriers, motor trucks, pipe lines, and airlines—largely exceeded the 941 figure, itself an all-time peak record in the handling of freight traffic. The combined freight movement of all five agencies aggregated 956 billion ton-miles in 1942, compared with 761 billion ton-miles in 941. In passenger service, all commercial agencies of transport performed an aggregate of 79 billion passenger-miles in 1942, compared with 48 billion in 1941.

The railroads in 1942 handled more than 80 per cent of the increase over 1941 in total domestic freight movement and nearly 80 per cent of the total increase in passenger travel; a fact which clearly demonstrates the dependence of the country upon the railroads for transportation service in time of emergency.

An outstanding example of the efficiency of coordinated transportation, under pressure of wartime needs, is that of the rail-water movement of ore passing over the Great Lakes during the 1942 season. All records were broken, the Office of Defense Transportation having recently reported that iron ore carriers on the Great Lakes brought down 92,077,000 gross tons in 1942.

A number of significant developments took place in 1942 affecting the agencies of transport with which the railroads are in competition.

The Interstate Commerce Commission on January 29, authorized an increase of 10 per cent in interstate bus rates. A minimum wage order of 40 cents per hour in the Property Motor Carrier Industry was issued by the administrator of the Wage and Hour Division, United States Department of Labor, effective March 16, 1942. The new minimum affected the hourly wage rates of some 70,000 persons (terminal employees, loaders, clerical workers, etc.) employed by about 40,000 truck operators. The industry employs about 600,000 persons altogether.

The War Production Board in August froze production of new motor buses and provided for their sale only as authorized by the Office of Defense Transportation. The WPB had in April halted the production of all medium and heavy trucks for civilian use. Production of passenger cars and light trucks was discontinued February 1.

The ODT issued a series of special orders directing various bus lines throughout the country to take such conservation measures as honoring each other's tickets, diversion of passengers to each other's lines, staggering of schedules between points common to their lines, and pooling of depot facilities.

Trucks were ordered by the ODT to load to at least 75 per cent of their capacity on return trips; buses were required to discontinue sightseeing and charter services. Present routings were frozen. Strict control was assumed by ODT over virtually all trucks, buses, taxicabs and similar commercial vehicles, and effective November 15, 1942, every vehicle affected was required to carry a Certificate of War Necessity issued by ODT. The speed limit of all rubber-tired vehicles in the United States has been restricted to 35 miles per hour.

Every local commercial delivery service was made subject to regulation, ODT Order No. 6 requiring that with certain exceptions, such service must cut down its 1941 monthly mileage by 25 per cent.

General orders affecting water carrier operation were confined largely to restrictions and regulations looking to greater utilization of Great Lakes carriers for transportation of iron ore, and for conservation of equipment for use in water movement of petroleum products. The result of these particular orders was to place considerable additional tonnage on the rails. Eventually, the ODT in October assumed control over all commercial vessels operating in domestic traffic on the Great Lakes. On the Eastern seaboard, wartime emergency control was assumed over all domestic water craft capable of transporting liquid cargo in bulk. Coastwise colliers were restricted to long haul traffic from Hampton Roads to New England points which could not be served effectively by barge line.

Section 204 (e) of the Second War Powers Act, 1942, gave the Interstate Commerce Commission the same emergency powers over motor carriers that it has over railroads.

Seats and cargo space on scheduled commercial airlines became subject to priorities on January 19. The priority list includes military personnel, Allied missions, Army and Navy equipment, and personnel of government departments whose activities are essential to the war effort.

The War Production Board in June approved the construction of a 24-inch steel crude oil pipe line 550 miles in length, from Longview, Texas, to Norris City, Illinois. The line may be completed early in 1943. Late in October, WPB approved an extension of the pipe line from Norris City to the Eastern Seaboard.

Railroad Retirement Board Operations

Railroad Retirement. Because of greater full-time employment, relatively fewer retirements, and generally improved business conditions, resulting in increased payrolls and larger tax collections, the financial position of the railroad retirement system was strengthened in 1942.

The rolls of the Railroad Retirement Board, as of October 31, 1942, included 158,283 beneficiaries. Compared with 155,360 beneficiaries on October 31, 1941, this represented a net increase of 2,923. The corres-

equipment for the twelve months ended October 1, 1943. This program was as follows:

	Needs for 12-months October 1, 1942 to October 1, 1943
New locomotives	900
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For the duration of the present war, few if any new

passenger-cars seem likely to be built for domestic use. About 40 per cent of the sleeping cars and 15 per cent of the coaches are now being continuously used for the movement of the armed forces. Many of the lounge, observation, and other so-called luxury cars have been converted to cars for transportation of troops and war workers.

Stored and Surplus Units. Stored serviceable locomotives averaged 1,135 during 1942 (11 months), compared with 1,749 during the year 1941. The serviceable freight car surplus in 1942 ranged from a minimum of 30,447 in October, to a maximum of 89,361 on January 3, compared with a range of from 38,511 to 193,344 in 1941. It is clear that equipment reserves were lower in 1942 than in 1941.

Manpower

As in other industries, manpower became a growing problem in the railway industry during 1942. The Division of Transport Personnel of ODT has dealt actively with general personnel and training questions in all phases of transportation. Co-operating with that division, the Association of American Railroads set up an Advisory Committee on Manpower, consisting of six operating and technical officials of railways in the three districts, together with one AAR representative. This committee held frequent conferences, both by means of meetings at Washington, and by exchange of correspondence, bulletins, and memoranda. In addition, the Railroad Retirement Board enlarged and intensified the activities of its employment placement service.

The AAR conducted two general inquiries into the manpower situation, one in February and one in September. The latter inquiry showed that as of September 15 a shortage of 59,416 workers existed on the properties of railways of Class I, classified by general groupings and districts as set out in Table V.

Table V. Unfilled Positions on September 15

	East	South	West	U. S.
Professional, clerical, etc.	774	383	1,335	2,492
Maintenance of way	13,155	1,057	20,913	35,125
Maintenance of equipment	5,428	1,103	7,563	14,094
Transportation:				
Train and engine	874	301	2,407	3,582
Other	1,802	271	2,039	4,112
Miscellaneous	6	4	1	11
Total	22,039	3,119	34,258	59,416

Considering these statistics districtwise, it is clear that the Western lines were in greater relative need of labor than those in the East or South. Compared with the number of men who were counted at work on September 15, the shortage was 6.7 per cent in the West, 3.5 per cent in the East, and 1.7 per cent in the South.

Considering the statistics by general groups of employees, the greatest relative shortage was found in the maintenance of way classification, where the shortage ratio on September 15 was 12.0 per cent. Corresponding ratios for other general groups were 4.0 per cent for maintenance of equipment employees, 2.5 per cent for transportation employees (all classes combined) and 1.2 per cent for the professional, clerical and general group.

Because of track labor shortages in the West, and particularly the Southwest, certain carriers sought government authority to bring in Mexican workmen for such employment. Government agencies held many conferences on the subject, and were apparently ready by the close of the year to authorize such importations, up to perhaps 10,000 workers.

Employment and Wages. Total rail employment was higher at all times in 1942 than in 1941, but the spread narrowed quite sharply during the year, as indicated in the text table herewith.

	Employment in 1942 Per cent increase over 1941
January-March	13.8
April-June	13.1
July-September	9.8
October-November	9.0
Eleven months	11.5

Railway employment, in 1942, averaged 1,270,000 persons, an increase of 11.4 per cent over 1941 and 28.6 per cent over 1939.

The railroad payroll for 1942 aggregated $2,900,000,000, an increase of 24.5 per cent over 1941, and 55.8 per cent over 1939.

Average annual earnings of employees increased from $2,045 in 1941 to $2,286 in 1942, an increase of 11.8 per cent, while their average hourly compensation increased from 78.0 cents to 85.1 cents, or 9.1 per cent.

Table VI shows the average number of employees, the aggregate payroll, and average earnings of employees, in each year from 1937 to 1942.

Table VI. Employees and Their Compensation

		Compensation (millions)	Average Compensation	
	Average Number		Per employee	Per hour (cents)
1942	1,270,000	$2,900	$2,286	85.1
1941	1,139,925	2,331	2,045	78.0
1940	1,026,848	1,964	1,913	75.1
1939	987,675	1,863	1,887	74.9
1938	939,171	1,746	1,859	75.0
1937	1,114,663	1,985	1,781	70.9

Wages of 1942 reflect the full effect of the wage rate advances obtained by the employees in late 1941.

In the fall of 1942 (September 25) the so-called "non-operating" railway employees—clerical, maintenance, shopcraft, telegraphers, and signalmen, etc.—made further demands on the railroads for:

1. An increase in wage rates of 20 cents an hour, with the additional demand that no employee shall be paid less than 70 cents an hour.
2. A closed shop.

It is estimated that these wage demands of the non-operating employees, if granted in full, would cost the carriers approximately $450,000,000 per year. At the close of the year this dispute had been accepted by the National Mediation Board for mediation.

The "operating" group of employees—enginemen, firemen, conductors, trainmen, and switchmen—meeting in Chicago in early December, decided also to demand a considerable increase in pay. Although they have not yet presented the demands formally, the operating employees are preparing to demand an increase in pay of 30 per cent, with a minimum increase of $3.00 in the present daily rate. Such an increase would cost the carriers more than $300,000,000 per year in increased wages.

Thus the demands of the two general groups, if met in full, would mean an increased annual cost (not including the additional payroll tax) of approximately $750,000,000 to the carriers.

Material and Supply Costs

The index of average unit prices of railway materials and supplies developed semi-annually by the Bureau of Railway Economics stood at 153.0 in December, 1942, the base being the month of May, 1933, as 100. The

corresponding index was 153.1 for materials other than fuel, and 152.8 for fuel. Table VII compares these price indexes, for certain selected dates from 1933 to the end of 1942.

Table VII. Railroad Material Prices

	Material and Supplies (Other than fuel)	Fuel (Coal and oil)	All Material
May, 1933	100.0	100.0	100.0
June, 1939	125.3	135.4	128.6
December, 1939	130.7	134.3	131.9
December, 1940	133.7	135.1	134.1
December, 1941	146.4	148.4	147.0
June, 1942	151.8	152.6	152.0
December, 1942	153.1	152.8	153.0

Comparing the price index at the end of 1942 with that a year earlier, the increases during the year were 4.6 per cent for materials and supplies, 3.0 per cent for fuel, and 4.0 per cent for all material. Compared with June, 1939 (just prior to the outbreak of the war), the war period increases to date have been 22.2 per cent for material and supplies, 12.9 per cent for fuel, and 19.0 per cent for all material.

Rates and Fares

The Office of Price Administration and the Department of Agriculture filed a petition with the Interstate Commerce Commission early in December, requesting the removal of the increases in freight rates and passenger fares authorized by the Commission earlier in the year in Ex Parte 148. The passenger fare increase, averaging about 9 per cent, became effective on February 10, while the freight rate increases, averaging about 4.7 per cent on all freight traffic, became effective on March 18.

Rail carriers replied to these petitions on December 15, calling upon the Commission to deny the petitions. The Commission, at the time of going to press, had announced no decision in the matter. It may either deny the petitions without hearing, hear oral argument, or reopen the whole proceeding for further hearings, review, and reconsideration. The railroads in their reply called the operations of the year 1942 abnormal, pointed to the long period of subnormal years since 1929, and emphasized the necessity of having financially strong railroads to ensure their ability to continue to meet the war emergency.

Other important developments in the rate field may be briefly outlined. The Commission authorized Southeastern lines to increase their basic coach fares from 1.65 cents to 2.2 cents per mile; this became effective on October 1. In October, also, the Commission vacated its order of April 13, 1925, which required railroads to issue interchange mileage tickets.

The Commission in November extended to June 15, 1943, the voluntary reductions in oil rates into Eastern District, running from 25 to as much as 50 per cent.

Under the terms of the Emergency Price Control Act of October 2, all carriers were required to give the OPA 30 days' notice of proposed general increases in rates and fares. The OPA in November issued its interpretation of the phrase "general increase" as any change in rates that "results in an increase in charges for transportation" and is "applicable to a class of passengers, shippers, or customers."

Despite increased freight rates, average revenue per ton-mile continued to decline in 1942. Continued demand for movement of heavy commodities moving long distances, such as iron ore, coal and coke, and iron and steel products, had its effect. In addition, the carriers made voluntary rate reductions on many war-affected commodities—such as oil, ammunition, rubber, etc.—which tended to offset the increases effected on other commodities.

Average revenue per passenger-mile in 1942 reflected the increased fares authorized by the Commission as of February 10.

Table VIII shows the average revenue per ton-mile and per passenger-mile for the years 1922, 1932, and for each year from 1935 to 1941.

Table VIII. Revenue per Traffic Unit

	Per Ton-Mile (cents)	Per Passenger-Mile (cents)
1942 (10 mos.)	0.924	1.910
1941	0.935	1.753
1940	0.945	1.754
1939	0.973	1.839
1938	0.983	1.874
1937	0.935	1.794
1936	0.974	1.838
1935	0.988	1.935
1932	1.046	2.219
1922	1.177	3.027

Revenue per ton-mile in 1942 was lower than in any year since 1918. Revenue per passenger-mile in 1942 was lower than in any year prior to 1936.

Railway Financing

Railway financing authorized by the Interstate Commerce Commission under the provisions of Section 20a of the Interstate Commerce Act, for the twelve months ended October 31, 1942, totaled $732,642,265, plus 4,136,192 shares of stock without par value. These figures do not include notes or other obligations given by carriers to the Reconstruction Finance Corporation.

Equipment-trust obligations to finance the purchase of new equipment accounted for $64,449,000 of the capitalization authorized. This is $210,910,000 less than the amount of equipment-trust obligations authorized in the similar preceding period, due principally to the inability of carriers to get equipment. Interest rates were slightly higher, the average being 2.31 per cent.

The Railroad Credit Corporation made liquidating payments aggregating 2 per cent during 1942 to participate in its pool. As of November 20, 1942, a total of $63,910,966, or 87 per cent, of the original loan fund had been liquidated by pro rata distributions to participants in the fund.

Table IX. Amounts paid by 24 railways from current cash, without recourse to outside financing, for

	1941 (year)	1942 (10 mos.)
1. Road and equipment	$177,064,000	$195,062,000
2. Redemption of equipment obligations, payments on conditional sales agreements, and down payments on new equipment	105,841,000	129,495,000
3. Reduction of short term loans	20,125,000	20,264,000
4. Reduction of long term debt, including operation of sinking funds but excluding amounts included in Item 2, above	160,001,000	180,048,000
Total items 2-4	$285,967,000	$329,807,000
Gross total—4 items	$463,031,000	$524,869,000

Rail carriers have used increased earnings to pay for additions and betterments, many of which have been necessitated by the war effort, on a cash basis rather than through any increase in outstanding debt. Likewise, a substantial amount of current earnings has been utilized

to redeem or pay off existing debt obligations. Table IX shows what has been done recently by 24 large railroad companies, earning about 75 per cent of the total operating revenues of Class I railways. These figures are based upon special reports furnished by the 24 companies in question.

The Competitive Situation

Impact of war upon the country's transportation system wrought far-reaching changes in the competitive situation, many of which are probably temporary in character. The altered complexion of the transportation problem of past years, from one of surplus facilities to one of maximum utilization of existing facilities, which was in evidence in lesser degree a year ago, became still more evident during 1942. Instead of keen competition, the emphasis in 1942 was upon the most effective distribution of traffic among the several agencies. This trend was furthered by the exigencies of war, which for one reason or another transferred large quantities of traffic from one agency to another. Diversion of domestic tankers and cargo vessels to foreign service, and cessation of intercoastal water movement, have resulted in shifting to the rails a large tonnage of petroleum and other products. Shortage of rubber, and the now nation-wide rationing of gasoline, have transferred to railroads much traffic that in the recent past was carried by motor trucks. Other important shifts took place, with respect to both tonnage and the geographical pattern of movement.

The total amount of transportation service rendered in the United States in 1942 far outdistanced all previous records. On a ton-mile basis, all modes of transportation—railroads, water carriers, motor trucks, pipe lines, and airlines—largely exceeded the 941 figure, itself an all-time peak record in the handling of freight traffic. The combined freight movement of all five agencies aggregated 956 billion ton-miles in 1942, compared with 761 billion ton-miles in 941. In passenger service, all commercial agencies of transport performed an aggregate of 79 billion passenger-miles in 1942, compared with 48 billion in 1941.

The railroads in 1942 handled more than 80 per cent of the increase over 1941 in total domestic freight movement and nearly 80 per cent of the total increase in passenger travel; a fact which clearly demonstrates the dependence of the country upon the railroads for transportation service in time of emergency.

An outstanding example of the efficiency of coordinated transportation, under pressure of wartime needs, is that of the rail-water movement of ore passing over the Great Lakes during the 1942 season. All records were broken, the Office of Defense Transportation having recently reported that iron ore carriers on the Great Lakes brought down 92,077,000 gross tons in 1942.

A number of significant developments took place in 1942 affecting the agencies of transport with which the railroads are in competition.

The Interstate Commerce Commission on January 29, authorized an increase of 10 per cent in interstate bus rates. A minimum wage order of 40 cents per hour in the Property Motor Carrier Industry was issued by the administrator of the Wage and Hour Division, United States Department of Labor, effective March 16, 1942. The new minimum affected the hourly wage rates of some 70,000 persons (terminal employees, loaders, clerical workers, etc.) employed by about 40,000 truck operators. The industry employs about 600,000 persons altogether.

The War Production Board in August froze production of new motor buses and provided for their sale only as authorized by the Office of Defense Transportation. The WPB had in April halted the production of all medium and heavy trucks for civilian use. Production of passenger cars and light trucks was discontinued February 1.

The ODT issued a series of special orders directing various bus lines throughout the country to take such conservation measures as honoring each other's tickets, diversion of passengers to each other's lines, staggering of schedules between points common to their lines, and pooling of depot facilities.

Trucks were ordered by the ODT to load to at least 75 per cent of their capacity on return trips; buses were required to discontinue sightseeing and charter services. Present routings were frozen. Strict control was assumed by ODT over virtually all trucks, buses, taxicabs and similar commercial vehicles, and effective November 15, 1942, every vehicle affected was required to carry a Certificate of War Necessity issued by ODT. The speed limit of all rubber-tired vehicles in the United States has been restricted to 35 miles per hour.

Every local commercial delivery service was made subject to regulation, ODT Order No. 6 requiring that with certain exceptions, such service must cut down its 1941 monthly mileage by 25 per cent.

General orders affecting water carrier operation were confined largely to restrictions and regulations looking to greater utilization of Great Lakes carriers for transportation of iron ore, and for conservation of equipment for use in water movement of petroleum products. The result of these particular orders was to place considerable additional tonnage on the rails. Eventually, the ODT in October assumed control over all commercial vessels operating in domestic traffic on the Great Lakes. On the Eastern seaboard, wartime emergency control was assumed over all domestic water craft capable of transporting liquid cargo in bulk. Coastwise colliers were restricted to long haul traffic from Hampton Roads to New England points which could not be served effectively by barge line.

Section 204 (e) of the Second War Powers Act, 1942, gave the Interstate Commerce Commission the same emergency powers over motor carriers that it has over railroads.

Seats and cargo space on scheduled commercial airlines became subject to priorities on January 19. The priority list includes military personnel, Allied missions, Army and Navy equipment, and personnel of government departments whose activities are essential to the war effort.

The War Production Board in June approved the construction of a 24-inch steel crude oil pipe line 550 miles in length, from Longview, Texas, to Norris City, Illinois. The line may be completed early in 1943. Late in October, WPB approved an extension of the pipe line from Norris City to the Eastern Seaboard.

Railroad Retirement Board Operations

Railroad Retirement. Because of greater full-time employment, relatively fewer retirements, and generally improved business conditions, resulting in increased payrolls and larger tax collections, the financial position of the railroad retirement system was strengthened in 1942.

The rolls of the Railroad Retirement Board, as of October 31, 1942, included 158,283 beneficiaries. Compared with 155,360 beneficiaries on October 31, 1941, this represented a net increase of 2,923. The corres-

ponding increase in 1941 was 7,233. Annuitants (as distinguished from pensioners, or persons transferred from the pension rolls of the carriers in 1937) increased by 6,337 persons, compared with an increase of 11,198 during the year ended October 31, 1941. Deaths among pensioners accounted for a net decline of 3,414 persons during the 1942 period, compared with a 1941 decrease of 3,965.

Total benefit disbursements in October, 1942, expanded to an annual basis, aggregated $121,570,000. This was an increase of $2,791,000 over October, 1941. The increase in annual disbursements between October, 1940, and October, 1941, was $6,266,000.

Rising employment and payrolls were reflected in an increase of 26 per cent in retirement tax accruals during 1942.

A summary statement of retirement tax accruals, interest, and expenditures for the entire period of operation of the retirement system, from 1937 to October 31, 1942, follows:

Tax accruals		$807,704,000
Interest		11,797,501
		$819,501,501
Less:		
Benefit payments	$589,203,388	
Administrative expenses	23,542,249	612,745,637
Balance		$206,755,864

The balance of $206,755,864 shown above includes taxes accrued but not yet collected. It does not, however, represent the actual balance to the credit of the Railroad Retirement Account, which includes Congressional appropriations in excess of tax collections. The actual balance as of October 31, 1942, was $276,745,113, of which $196,000,000 was invested in 3 per cent Treasury notes.

Railroad Unemployment Compensation. The rising trend of railroad employment in 1942 materially reduced unemployment insurance benefit costs. Aggregate benefit disbursements during the first ten months of 1942 amounted to $5,964,000, compared with $12,999,000 during the corresponding period of 1941.

Tax accruals for the first ten months of 1942 aggregated $70,000,000, compared with $55,700,000 in the same period of 1941. The combination of both of these factors—lower benefit disbursements and larger tax receipts—tended to further swell the already large railroad unemployment insurance reserve.

The status of the Railroad Unemployment Insurance Account, covering the whole period of operations from July 1, 1939, to October 31, 1942, is shown in the following tabulation.

Receipts:		
Net tax contributions	$203,816,298	
Transfers from state accounts	105,900,769	
Transfers from administration fund	17,382,967	
Interest on investments	10,200,651	
Total		$337,300,685
Expenditures:		
Net benefit payments		42,158,437
Balance		$295,142,248

Administrative expenses of the system for the entire period of operation, from July 1, 1939, to October 31, 1942, amounted to $12,267,000.

Board of Investigation and Research

The Board of Investigation and Research was established by the Transportation Act of 1940, to make investigations and report its conclusions and recommendations relating to the nation's transportation system. The Board, which assumed office on August 22, 1941, comprises Messrs. Nelson Lee Smith, designated by the President as chairman, C. E. Childe, and Robert E. Webb.

The life of the Board was set in the act at two years, or until September 18, 1942, subject to an extension of not more than two years by Presidential proclamation. The President, on June 26, 1942, extended the term of the Board to September 18, 1944. Congress in 1942 appropriated $500,000 for the work of the Board for the fiscal year ending June 30, 1943. In addition, there was made available its unexpended balances from the previous fiscal year, amounting to $143,330.

The Board in September reported the following progress in the fulfillment of its several statutory assignments:

Relative Economy and Fitness. Study of this subject is proceeding along the following lines: (1) Volume and composition of the traffic of the country, and its distribution among the major carrier agencies; (2) Relative economy of the several types of carriers, as reflected by their comparative costs; (3) Ability of the several types of carriers to furnish needed service and the possibilities of improving their efficiency; (4) Comparative labor standards found in the respective carrier fields; (5) Effects of regulatory policy upon the relative economy and fitness of the several types of carriers.

Public Aids. The Board has collected and analyzed a large amount of data pertaining to this subject. This work was progressed by hearings from June 29 to July 3, 1942, at which time testimony was offered by interested groups and individuals, with respect to various aspects of public aids to transportation. The Board, itself, submitted a series of exhibits containing data which it had compiled. Following the hearings, briefs were filed by several organizations which had participated in the hearings.

Taxation. The study of carrier taxation has proceeded along the following lines: (1) Determination of the extent of payments, by the several transportation agencies, of taxes of all types to the various levels of government; (2) Investigation of the relative tax burdens borne by the various carriers; and (3) Examination of carrier tax laws and their administration.

The Board expects to complete its report on public aids early in 1943, and its report on carrier taxation by the end of the current fiscal year. The Board's investigation of relative economy and fitness of carriers may require a longer period for completion.

Transportation and National Policy

A significant report concerned with transportation, particularly railroad transport, was released in November, 1942, by the National Resources Planning Board, under the title "Transportation and National Policy."

The report had its inception in a request to the Board by the President in January, 1940. The study was inaugurated in July, 1940. A nucleus staff was assembled by the Board to undertake the work, supplemented by various staff members of federal agencies concerned with transportation. The Board created an Advisory Committee for the Transportation Study, under whose general guidance the study was conducted. This committee was headed by Owen D. Young as chairman.

The report is made up of 22 separate monographs contributed by 21 different authors. As a result, differing and sometimes divergent views are expressed. Dr. Ralph J. Watkins, director of the study contributes a summary report containing twelve policy recommendations, together with brief statements of the transportation problems which they are intended to solve.

The keynote of the report is the recommendation that a National Transportation Agency, with broad powers, be established within the federal government. Such an agency would carry out many of the policies and plans advocated, including unification of government planning, development, and administrative functions in the field

of transportation; assumption of leadership in programs for transport consolidation, co-ordination, reconstruction, and terminal unification; promotion of air and highway transport facilities, and the devising of suitable means under which the credit of the government would become available "to the end that the formidable tasks of railway modernization and improvement may be included in public works programs." Compulsory consolidation of rail carriers into a comparatively few regional systems is suggested. The report also suggests the desirability of having the government own railroad rights-of-way, roadbeds and fixed property, in order to equalize the competitive disadvantages produced by federal provision of highway, waterway and air transport facilities. A much larger measure of government control over transportation in general, and the railroads in particular, would follow from the adoption of the report's recommendations.

The report was submitted to the National Resources Planning Board by its Advisory Committee with the comment: "It must not be understood, however, that the members of the Advisory Committee necessarily endorse the views set forth in these contributions, since full liberty of expression was accorded to the individual authors and agencies." The Board, in transmitting the report to the President, endorsed the establishment of "a permanent National Transportation Agency," and the "building of a superior and more effective transport system."

Legislation and Legal Action

Congressional action during its 1942 session consisted primarily of consideration of measures related to the war effort. Among measures of interest to the railroads, the following may be mentioned.

Railroad Adjustment Act (Public Law 747—77th Congress) This legislation, originally introduced by Representative McLaughlin of Nebraska in March, 1942, received Presidential approval on October 16. Substantially a re-enactment of the Chandler Act, it permits railroads to be reorganized without going through bankruptcy. The measure is limited to proceedings initiated on or before November 1, 1945.

Regulation of Freight Forwarders (Public Law 558—77th Congress) This measure was first introduced in the Senate on January 8, 1941, by Senators Wheeler and Reed, as S.210. After extensive hearings, and radical revision of the original text, the bill became law on May 16, 1942. The act constitutes Part IV of the Interstate Commerce Act, and provides for regulation of freight forwarders by the Interstate Commerce Commission.

Revenue Act of 1942 (Public Law 753—77th Congress) The new tax bill, approved by the President on October 21, 1942, contains a number of features of importance to railroads: (1) An amendment under which a corporation may purchase its outstanding securities without being subject to tax penalty and without the necessity of obtaining a certificate showing it to be in an unsound financial condition. This provision terminates on December 31, 1945. (2) Provision of tax relief in connection with railroad reorganizations. (3) Authorization for a two-year carry-back of operating losses and of unused excess profits credit which, it is said, will aid companies with respect to deferred maintenance. The law imposed a ten per cent tax on passenger transportation which replaces the former impost of 5 per cent; also a new tax of 3 per cent on freight transportation. A penalty of 2 per cent of surtax net income is imposed on corporations filing consolidated tax returns. Corporations are given the privilege of making an annual declaration of value with respect to capital stock and declared value excess profits taxes.

Amendment of Natural Gas Act (Public Law 444—77th Congress) A bill to amend section 7 of the Natural Gas Act, H.R. 5249, became law on February 7, 1942. Prior to its passage, coal, labor, and railroad interests were not permitted, under rulings of the Federal Power Commission, to intervene in proceedings on applications for the construction or extension of natural gas pipe lines. The law, as amended, removes this prohibition. It also provides that no new line can be constructed, even into territory not now served by natural gas lines, without a certificate of convenience and necessity.

Railroad Retirement Acts Amended (Public Law 520—77th Congress) An amendment to the Railroad Retirement Acts (H.R. 6387), introduced by Representative Crosser of Ohio, became law on April 8, 1942. The measure provides for crediting of military service of railroad employees, subsequent to 1936. Military service prior to January 1, 1937, was already creditable under provisions of previous enactments.

Florida Barge Canal and Pipe Line Bill (Public Law 675—77th Congress) Chairman Mansfield of the House Committee on Rivers and Harbors introduced H.R. 6999 in April, authorizing construction of a twelve-foot barge canal across Florida, together with a connection to the eastern terminus of the Intracoastal Waterway, enlargement of the Intracoastal Waterway from that point to Corpus Christi, Texas, and its extension to the Mexican border; also construction of a pipe line across Florida. As amended by the House, the bill also authorized construction of a crude oil pipe line from Charleston or Savannah to the vicinity of Yazoo City, Miss. The measure, which became law on July 23, 1942, contained an authorization for the appropriation of $93,000,000 to carry out the provisions of the Act. It is expected that the pipe line across Florida will be completed and put into operation before the close of this year. Construction of the canal will probably be postponed for the duration, on account of the critical materials and manpower situation.

Anti-Inflation Act (Public Law 729—77th Congress) This wartime measure which became law on October 2, 1942, carries the following provision: "No common carrier or other public utility shall make any general increase in its rates or charges which were in effect on September 15, 1942, unless it first gives thirty days notice to the President, or such agency as he may designate, and consents to the timely intervention by such agency before the federal, state, or municipal authority having jurisdiction to consider such increase."

Legislation Considered but not Passed

Land Grant Deductions (H.R. 6156). On December 2, 1941, Chairman Lea introduced an amendment of the Transportation Act of 1940, which would have eliminated all land grant deductions. Hearings were held on the measure in February, 1942, and it was reported favorably by the committee on March 11. When the bill came before the House, it was referred back to the Committee on Interstate and Foreign Commerce without instructions. The measure had not only railroad and shipper support, but was favored by the Interstate Commerce Commission, the Office of Defense Transportation, the Office of Price Administration, and representatives of railroad labor.

Sizes and Weights of Motor Vehicles (S.2015) As a result of recommendations by the Interstate Commerce Commission, following its investigation in Ex Parte MC-15, Sizes and Weights of Motor Vehicles, Senator Wheeler introduced S.2015 in October, 1941. This bill would empower the Commission to modify any State regulation fixing maximum sizes and weights for motor vehicles operating over the highways of such state. Hearings were held in January, 1942. No committee report on the measure has been made, due possibly to the action of state governors who in June agreed to uniform minimum standard and reciprocal license arrangements with respect to motor transport for the duration of the emergency.

Legal Action

Train Limit Laws. The Arizona Train Limit Law was declared unconstitutional, insofar as it applies to interstate commerce, in a decision rendered by Judge Levi S. Udall of the Superior Court of the State of Arizona on February 11, 1942. Among other things, the Court held that the law is an undue interference with the movement of interstate traffic, and instead of providing for increased safety brings about a greater number of accidents. The decision is now under appeal.

The Interstate Commerce Commission on September 11, 1942, issued Service Order 85, suspending for the duration the operation of state rules, regulations, practices or laws limitings the length of trains.

Job Protection in Abandonments—The United States Supreme Court in March ruled that the Interstate Commerce Commission has the power to attach labor-protection conditions in abandonment cases. This was in Interstate Commerce Commission and the Pacific Electric Railway Company vs. The Railway Labor Executives Association and the Brotherhood of Railroad Trainmen.

Reorganizations

A net reduction of five took place during 1942 in the total number of railway companies in receivership or trusteeship. The net change of five occurred as follows: Three Class I companies, the Wabash, the Norfolk Southern, and the Minneapolis & St. Louis were discharged from receivership, although in the case of the Minneapolis & St. Louis certain legal formalities will not be concluded until the spring of 1943. In addition, two Class II carriers, Chicago, Springfield & St. Louis, and Georgia, Southwestern & Gulf, and one Class III company, Louisiana Southern, terminated receivership proceedings. The properties of the Louisiana Southern were returned to the possession of the company without adjustment of its financial structure. One small leased line, Catonsville Short Line, was placed in receivership. One Class I company, the Alton, filed a petition in trusteeship late in 1942, which was approved by the District Court on December 14. During the year one Class III carrier, the Nevada Copper Belt, was discharged from trusteeship.

The Rutland Railroad Company on December 17 petitioned the District Court at Burlington, Vt., to be transferred from receivership to a trusteeship, but the matter was not formally before the Interstate Commerce Commission, pending court approval.

Of the 86 companies in the hands of the courts at the end of 1942, 31 were Class I railways. Five of these, operating 5,607 miles of road, were in receivership, while 26, operating 59,087 miles, were in trusteeship. A total of 66,179 miles of railroad, of all classes, was in receivership as of December 31, 1942, a net decrease of 3,680 miles during the year. This mileage represented 27.0 per cent of total rail mileage of the United States.

Plans for reorganization of the Florida East Coast and the Minneapolis, St. Paul & Sault Ste. Marie, were given final approval by the Interstate Commerce Commission, and the plan for the latter company subsequently received District Court approval. Two plans, previously disapproved by the respective courts to which they had been certified, were modified and given Commission approval in their modified form. These involved the New York, New Haven & Hartford and the Denver & Rio Grande Western. A modified plan for the St. Louis-Southwestern was issued by the Commission, on which court hearings were held in November. A protective committee for holders of bonds of the Chicago, Indianapolis & Louisville filed a modified plan of reorganization early in 1942, a previous plan by the same committee having been disapproved by the Commission. A proposed plan of reorganization for this company was submitted to the Commission on December 23 by one of its examiners. A new plan for reorganization of the New York, Susquehanna & Western was filed on November 13, 1942, by three insurance companies, large holders of the debtor's securities. The Seaboard Air Line, a road in receivership, filed a plan of reorganization, dated July 1, 1942.

While railroad earnings showed improvement during the current period, there was little indication of more liberal treatment, by courts or Commission, of equity holders of reorganized companies.

Proceedings in trusteeship were characterized during the period by an increasing amount of litigation, particularly with respect to actions in the higher courts. In the case of the St. Louis-San Francisco, a plan certified to the District Court by the Interstate Commerce Commission was disapproved by the court and returned to the Commission for further action. In two instances, Chicago & North Western, and Akron, Canton & Youngstown, where plans had been approved by the respective District Courts, appeals were taken to Circuit Courts of Appeal. In both cases, the appellate courts confirmed the decisions of the lower courts. Three proceedings culminated in petitions to the United States Supreme Court for writs of certiorari to review judgments rendered by Circuit Courts of Appeal. These actions involve the Western Pacific, the Chicago, Milwaukee, St. Paul & Pacific, and the Chicago & North Western. The Supreme Court agreed to review the decisions with respect to the two former companies, but no decision has yet been announced, as to its disposition of the Chicago & North Western case.

The Colorado & Southern Railway Company on February 19 requested approval by the Interstate Commerce Commission of a plan for voluntary adjustment of its debt structure. The company later submitted a revised plan, under which fixed charges would be reduced from over $2,000,000 annually to somewhat less than $1,000,000. This has been approved by the Commission, and confirmed by the District Court at Denver. The Delaware & Hudson submitted a voluntary debt adjustment plan to certain of its bondholders on December 23 under provisions of the McLaughlin Act.

The Revenue Act of 1942, approved by the President on October 21, contains provisions regarded as tax relief in connection with railroad reorganizations. In order to clear up the question as to whether or not reorganizations of railroads constitute tax-free reorganizations for income tax purposes, the new act provides in effect that in the case of such reorganizations in tax-

able years beginning after December 31, 1939, the basis of the property of the old corporation shall not be reduced if the transfer of the property is in pursuance of an order of the court having jurisdiction of such corporation in receivership proceedings or in proceedings under Section 77 of the Bankruptcy Act. It is further provided that there shall be no addition to taxable income in case of reorganized railroads by reason of reduction of bonded and other indebtedness.

Traffic and Revenue Trends

The outstanding facts regarding the traffic situation in 1942 may be summarized briefly. Carloadings showed an increase of 1.2 per cent over 1941, the small increase being due largely to a sharp drop in LCL movements. Carload traffic increased 8.6 per cent, whereas LCL loadings decreased 30.4 per cent.

Ton-miles and passenger-miles broke all existing records in 1942. Ton-miles exceeded the preceding

Table X. Comparative Traffic Statistics

Revenue Carloadings (Thousands)			
1942	42,800	1939	33,911
1941	42,285	1938	30,457
1940	36,358	1937	37,670
Revenue Ton-Miles (Millions)			
1942	630,000	1939	333,438
1941	475,072	1938	290,084
1940	373,253	1937	360,620
Revenue Passenger-Miles (Millions)			
1942	53,000	1939	22,651
1941	29,350	1938	21,629
1940	23,762	1937	24,655

record year (1941) by 32.6 per cent, the next preceding record year (1929) by 41.0 per cent, and 1918 by 55.4 per cent. Passenger-miles topped 1941 by 80.6 per cent, the preceding record year (1920) by 13.1 per cent, and 1918 by 24.2 per cent.

Table X summarizes the levels of railway freight and

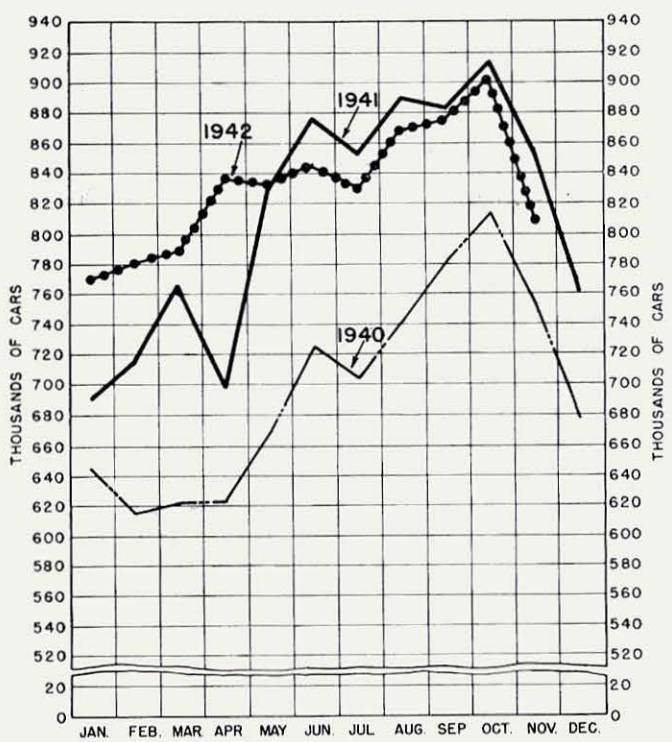

Chart A—Average Weekly Freight Carloadings By Months, 1940, 1941 and 1942

passenger traffic for each of the years 1937 to 1942. Freight traffic is shown in terms of both carloadings and revenue ton-miles.

Carloadings. Revenue carloadings in 1942 aggregated 42,800,000 cars, an increase over 1941 of 515,000, or 1.2 per cent. The monthly trends are outlined on Chart A, which shows average weekly carloadings in each month of 1940, 1941 and 1942.

Total carloadings ran above 1941 until May. The effect of ODT Order No. 1, relating to LCL freight, began to exert itself in March and April. It seems probable that ODT Order No. 18 affected carload movement during November and December, although the extent of the effect is difficult of measurement.

The contrasting trends during various periods of the year are illustrated by breaking the year into quarters, and also by dividing the statistics for each quarter into carload and LCL totals. The results appear in the following text table.

	Per Cent Increase (I) or Decrease (D)					
	Carload		L. C. L.		Total	
Jan.-Mar.	I	11.3	D	3.7	I	8.2
Apr.-June	I	13.5	D	32.9	I	4.2
July-Sept.	I	6.6	D	43.1	D	2.1
Oct.-Dec.	I	4.1	D	41.4	D	4.2
Year	I	8.6	D	30.4	I	1.2

Table XI distributes the carloadings of 1942 among eight commodity groups, according to the classification of the Car Service Division, Association of American Railroads. The increase over 1941 (or decrease) for each group, and the percentage of change, are also shown in the table.

Table XI. Carloadings, by Commodity Groups

(Thousands)

	1942	Increase over 1941 Number	Per cent
Miscellaneous	19,747	1,309	7.1
Coal	8,360	769	10.1
Mdse., l. c. l.	5,595	*d* 2,447	*d* 30.4
Ore	3,011	329	12.3
Forest Products	2,442	255	11.6
Grain and products	2,167	144	7.2
Live stock	746	96	14.7
Coke	732	55	7.1
Total	42,800	510	1.2

Because of wide variations in the rate of increase of the several groups, 1941 to 1942, two shifts occurred in their relative positions. Merchandise, LCL, which in point of volume stood second in 1941, dropped to third place in 1942, exchanging positions with coal. Livestock and coke again exchanged places, coke dropping from seventh to eighth, and livestock moving up. Both of these commodity groups increased, but livestock increased at about twice the rate as coke.

The influence of war activities on the character of

Table XII. Percentage Increases in Carloadings, by Regions

	1942 over 1941	1941 over 1940
Southwestern	22.4	15.1
Southern	4.8	16.0
Pocahontas	4.4	8.3
Central Western	3.5	13.0
Northwestern	2.4	16.0
Allegheny	0.7	21.8
Eastern	*d* 7.6	16.6
Total	1.2	16.3

railway freight traffic is clearly reflected in these statistics. The largest carload increase took place in manufactured (miscellaneous) articles. Significant relative increases occurred in the movement of four groups close-

ly related to and serving the heavy industries—ore, forest products, coal, and coke. Due to conditions in the other segments of the transportation field, grain and livestock also showed appreciable increases.

Variations also occurred as among the several regions of the United States. As against an overall increase of 1.2 per cent in carloadings for the industry as a whole, regional changes ranged from an actual decrease of 7.6 per cent to a high of an increase of 22.4 per cent, as indicated in Table XII. Only one region—the Eastern—reported a decrease, while all others increased, the increases being relatively small except in the Southwest. The table shows also the relative increases from 1940 to 1941 for each region.

This table shows a considerable variation in the traffic trend—measured in terms of cars of revenue freight originated in the several regions. An appreciable increase took place in the Southwest, moderate increases in the other western regions, Southern and Pocahontas, a slight increase in the Allegheny region, and a decrease in the East. These 1942 trends differed considerably from those shown for 1941 in the second column of the table.

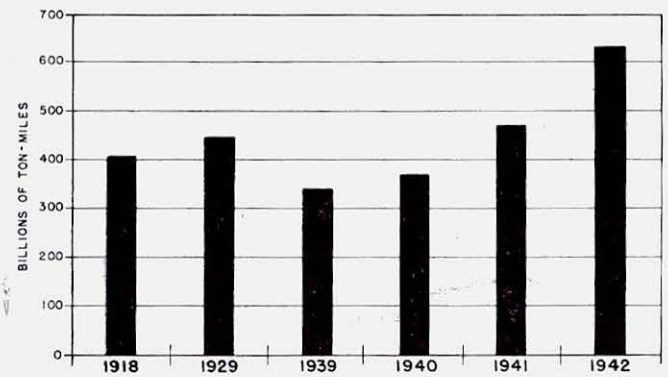

Chart B—Revenue Ton-Miles, 1918-1929 and 1939-1942

Ton-miles. Revenue ton-miles in 1942 exceeded those of any previous year, surpassing the former record year of 1941 by 32.6 per cent. The spread between ton-miles and carloadings continued to widen, the increase from 1941 to 1942 being 32.6 per cent as to ton-miles and only 1.2 per cent as to carloadings. Chart B compares the record volume of ton-miles in 1942 with the preceding three years and with 1929 and 1918.

Increased ton-mile movement tended to decline somewhat, as indicated in the following table. This was due, in part, to the fact that in the second quarter of 1941 the coal strike cut heavily into the traffic, and in part to the rising levels of freight traffic in the late months of 1941.

Per Cent Increase in Ton-Miles	
Jan.-Mar.	30.2
Apr.-June	44.6
July-Sept.	31.0
Oct.-Dec.	26.2
Year	32.6

Passenger-miles. Railway passenger traffic, in terms of passenger-miles, broke all records in 1942. The previous record, which was achieved in 1920 and had stood for more than twenty years, was 46.8 billion. The estimate for 1942 is 53 billion, which is 13.1 per cent greater than in 1920. Chart C shows the volume of passenger-miles in 1942 compared with the three preceding years and with 1920, the previous peak year, and the war year of 1918.

The increase from 29.4 billions in 1941 to 53 billions in 1942 represented a rise of 80 per cent. It seems probable that two-thirds or more of the increase was due to troop movements, men traveling while on military or naval furlough, and the like, while the remaining portion of the increase may be credited to more extensive utilization of rail service by civilians.

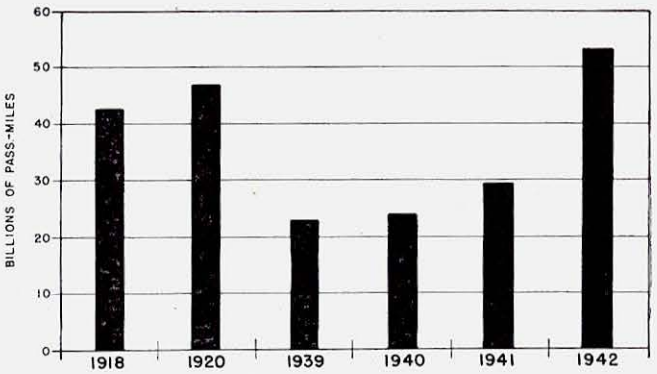

Chart C—Revenue Passenger-Miles, 1918, 1920 and 1939-1942

Not only did passenger-miles rise rapidly during the year 1942, but the upward movement was accelerated as the months went by. The following text table indicates this fact, showing as it does the proportionate increase in each quarter of the year, compared with the corresponding quarter of 1941.

Per Cent Increase in Passenger-Miles	
Jan.-Mar.	39.7
Apr.-June	67.0
July-Sept.	90.2
Oct.-Dec.	116.1
Year	80.6

Financial Results

A summary of the financial results of operation of Class I rail carriers in 1942 appears in Tables XIII to XVI, following. This summary is drawn as to 1942, from monthly reports; for the year 1941, the returns are those of annual reports. Because of the difficulty of estimating even approximate results for the calendar year 1942, all the entries in these tables for 1942 relate to the 12 months ended October 31, 1942.

Table XIII. Condensed Income Account

	1942 (millions)	1941 (millions)
Total operating revenues	$7,010	$5,347
Total operating expenses	4,451	3,664
Tax accruals	1,076	547
Net railway operating income	1,309	998
Net income (after fixed and contingent charges)	795	500

The operating ratio declined from 68.5 per cent in 1941 to 63.5 per cent in the twelve months ending October, 1942.

Taxes. Prior to 1941, the largest amount of taxes accrued by rail carriers in any one year was $396,683,000. This was in 1929. Aggregate taxes decreased subsequent to 1929, due largely to the sharp drop in taxable income, thus reducing federal and state income taxes. At the same time, the ratio of taxes to total operating revenues, measuring the relative burden or incidence of taxes, went up. Payroll taxes began to be assessed in 1936, and the gradual increase in that form of taxation, together with an improved income position in the last four years and much higher income tax rates, has brought total taxes up to a new high level. Railway tax accruals reached $547,230,000 in 1941 and in 1942 crossed the billion mark for the first time.

This great increase was due principally to a combination of three factors: Greater employment and higher wage rates, leading to an increase in payroll taxes from $138,128,000 in 1941 to $167,266,000 in the 1942 twelve-month period; an increase in taxable net income; much higher income tax rates, under the Revenue Act of 1942.

Prior to 1941, the highest ratio of taxes to revenues was experienced in 1938. In that year, 9.5 per cent, or 9.5 cents out of each revenue dollar, was absorbed by taxes. This ratio was 10.2 cents in 1941, and in the twelve months ended October, 1942, had risen to 15.4 cents.

Operating Revenues

Operating revenues of all classes increased in 1942, as shown in Table XIV, below. As before, entries for 1942 are for the twelve months ended October 31.

Table XIV. Operating Revenues

	1942 (millions)	1941 (millions)
Freight revenue	$5,653	$4,448
Passenger revenue	895	515
Mail revenue	110	108
Express revenue	84	57
All other	268	219
Total	$7,010	$5,347

Total operating revenues for 1941 exceeded 7 billions for the first time in American railroad history. The next greatest revenue aggregate was that for 1929, when the total was slightly greater than 6¼ billions.

The greatest revenue increase from 1941 to 1942 took place in freight revenue, while passenger and express revenues showed the greatest relative increases.

Operating Expenses

Table XV distributes total operating expenses into its several principal groups, comparing 1942 with 1941. The entries for 1942 are, as previously indicated, for the twelve months to October 31.

Contrary to recent trends, maintenance expenditures in 1942 showed a smaller relative increase than transportation. The explanation lies principally in the fact that materials and labor were not available in sufficient quantity to do the maintenance work that would otherwise have been undertaken.

Table XV. Operating Expenses

	1942 (millions)	1941 (millions)
Maintenance of way	$762	$603
Maintenance of equipment	1,180	993
Traffic	117	112
Transportation	2,169	1,775
General and other	223	181
Total	$4,451	$3,664

Net Earnings and Rate of Return

The rate of return on property investment (including road and equipment, cash, material and supplies) was 4.92 per cent in the twelve months ended October 31, 1942.

Table XVI shows the net railway operating income, and the rate of return on property investment, for each of the ten years from 1933 to 1942, inclusive.

For the first time since 1929, a period of thirteen years, the rate of return exceeded 4 per cent in 1942. During the 12 intervening years, 1930 to 1941, the rate ranged from a low of 1.24 per cent, in 1932, to a high of 3.75 per cent in 1941, a substantial record of subnormal earnings over so long a period.

Table XVI. Return on Investment

	Net railway operating income (thousands)	Rate of return (per cent)
1942 (Oct. 31)	$1,309,235	4.92
1941	998,256	3.75
1940	682,133	2.59
1939	588,829	2.25
1938	372,874	1.43
1937	590,204	2.27
1936	667,347	2.57
1935	499,819	1.93
1934	462,652	1.78
1933	474,296	1.82

Capital Expenditures and Purchases

Table XVII shows the gross expenditures made by Class I rail carriers for capital improvements, and for the purchase of material and supplies (including fuel), in each of the ten years from 1933 to 1942, inclusive. The entries in this table for 1942 are, necessarily, preliminary estimates.

While gross capital expenditures and railroad purchases both increased in 1940 and 1941, and again in 1942, as a result of the defense and war stimulus, the annual averages for those three years still remained below the corresponding annual averages of the eight years 1923 to 1930.

Table XVII. Capital Expenditures and Purchases

	Capital Expenditures (000)	Purchases of Material and Supplies (000)
1942	$600,000	$1,400,000
1941	543,021	1,161,274
1940	429,147	854,463
1939	262,029	769,314
1938	226,937	583,282
1937	509,793	966,383
1936	298,991	803,421
1935	188,302	593,025
1934	212,712	600,224
1933	103,947	465,850
Total, ten years	$3,374,879	$8,197,236

Capital expenditures for the twenty years 1923 to 1942 aggregated $10,645,701,000, or $532,285,000 per year. Railroad purchases over the same 20-year period aggregated $20,405,373,000, or $1,020,269,000 per year.

Operating Efficiency and Economy

Railroads in 1942 maintained, and in a number of respects improved, the fine record for efficiency and economy of operation which they achieved in both 1940 and 1941. It seems safe to conclude, upon survey of the whole situation, that operating efficiency has never been greater than in this first war year.

Several of the more significant efficiency factors are outlined in succeeding tables. The tables cover the six years from 1937 to 1941, include comparative statistics for the year 1932, ten years ago, and for the year 1922, which was the last complete year preceding the railroad efficiency program of 1923.

Table XVIII shows the average number of gross ton-miles and net ton-miles, per freight train-hour. The gross figures include, while the net figures exclude, the tare weight of the freight cars in the train.

This table, showing continuous increase in the average number of both gross and net ton-miles handled per

Table XVIII. Ton-Miles per Train-Hour

Year	Gross Ton-Miles	Net Ton-Miles
1942 (10 mos.)	35,874	16,216
1941	34,684	14,938
1940	33,811	14,028
1939	32,808	13,450
1938	31,141	12,473
1937	30,349	12,695
1932	22,046	10,265
1922	16,188	7,479

freight train-hour, speaks for itself. The record has been broken year after year for several years, was broken in 1941, and again in 1942.

Table XIX shows the average daily performance in miles run, of active locomotives and freight cars. Active locomotives are serviceable units, less those reported as stored. Active freight cars are serviceable units, less surplus units.

The fine achievement of rail carriers in 1941 and 1942, in respect of these factors of equipment performance, is brought out in this table. Both years showed record-breaking results.

The next table, Table XX, shows the average speed of freight and passenger trains, in miles per hour. These

Table XIX. Locomotive and Car Performance

Year	Miles per day per active unit: Freight Locomotives	Passenger Locomotives	Freight Cars
1942 (10 mos.)	122.5	204.5	50.6
1941	116.4	195.6	45.7
1940	107.5	190.8	42.2
1939	104.0	184.2	41.3
1938	99.3	178.6	39.0
1937	104.5	177.0	40.6
1932	86.2	161.5	34.0
1922	79.3	140.3	29.6

averages are not measurements of the running speed of trains while in motion, but takes into account total elapsed time between terminals.

After attaining an average freight train speed of 16.7 miles per hour in 1939 and 1940, the carriers showed a slight reduction to 16.5 miles in 1941, and another reduction to 15.9 miles in 1942. These decreases of the last two years are attributable to increasing density of traffic, and to the great increase in the average freight trainload. For example, traffic density increased from 4,792 net ton-miles per mile of road in 1940 to 8,060 in

Table XX. Average Train Speed

Year	Freight trains	Passenger trains (locomotive propelled)
1942 (10 mos.)	15.9	37.2
1941	16.5	37.6
1940	16.7	37.3
1939	16.7	36.9
1938	16.6	36.2
1937	16.1	36.0
1932	15.5	a
1922	11.1	a

a, Not reported.

1942, or 68 per cent, while the average trainload increased from 849 to 1,030 tons, or more than 21 per cent.

Heavy passenger traffic led also to a slight decrease in the average speed of passenger trains. The average for 1942 was, however, almost the same as in 1940, and was an improvement over all years of record prior to 1940. Here, again, the trainload has increased markedly. Passenger occupancy per train, which averaged 60.7 in 1940, increased to 73.2 in 1941, and increased again by a large upward surge to 115 in 1942. The rate of increase from 1940 to 1942 was 90 per cent.

Table XXI shows the growing load per freight train and per freight car. All trainload records were surpassed in 1942, and by a wide margin. The carload average was also a record.

The final table, dealing with economy, shows statis-

Table XXI. Average Freight Train and Car Load

Year	Net tons per train	Net tons per car
1942 (10 mos.)	1,030	31.5
1941	915	28.5
1940	849	27.6
1939	813	26.9
1938	759	26.1
1937	796	27.1
1932	663	24.9
1922	676	26.9

tics of locomotive fuel performance. These appear in Table XXII.

Here, again, was operating economy of a high order. Fuel performance in freight broke all records by a con-

Table XXII. Locomotive Fuel Performance

Year	Gross ton-miles per ton of fuel (freight service)	Passenger train car-miles per ton of fuel (passenger service)
1942 (10 mos.)	18,398	134
1941	18,091	134
1940	17,839	133
1939	17,774	135
1938	17,462	134
1937	17,133	133
1932	16,245	134
1922	12,273	112

siderable margin, and in passenger service was close to record levels.

Safety

The great increase in freight and passenger traffic on the railroads in 1942 necessitated the running of many more trains, the handling of many more cars, and a heavier loading per car and per train—both freight and passenger. Inevitably, this greater density of activity on the road, in yards, and in shops was accompanied by an increase in accidents, both numerically and relatively.

To appraise the accident statistics for 1942 in proper perspective, they should be compared with a period of somewhat similar density conditions. The year 1929, which marked the pre-war peak and the final year of the boom following the first World War, most nearly meets the qualification, although in terms of ton-miles and passenger-miles performed it fell considerably short of 1942.

The following table takes the first 10 months of 1929 as 100 in each case, and shows the corresponding index for the first 10 months of 1942.

Item	1929 (10 months)	1942 (10 months)
Number of train accidents	100	74
Employee fatalities	100	68
Employee injuries	100	54
Passenger fatalities	100	115
Passenger injuries	100	95
Total fatalities	100	82
Total injuries	100	58

Conclusion

Railroads did an excellent war job in 1942. This statement has support from every war agency, and from all classes of the public. Paraphrasing a brief summary of 1941 operations in our review of that year, the railroad story of 1942 consisted largely of accomplishment

completed in any year was in 1928, when 1,025 miles of line were placed in operation, and the smallest was the 24 miles completed in 1933, which was also the least mileage recorded in a single year since the first railway was constructed in 1830.

It is of more than passing interest that the aggregate mileage during the first period was 51,987, while that for the second period was only 7,185, for it is significant that the average mileage completed year by year during the earlier period was 2,599 miles, while the average for the two decades just closed was only 359 miles. These figures provide the strongest possible evidence that the days of large external developments are past and that future expenditures will be applied more and more for internal improvements and for expansion of those facilities that will expedite the movement of traffic.

Of the 74 miles of new lines placed in service during the year, 30 miles represented the relocation of the tracks of the Southern Pacific to replace tracks that will be submerged by the pool back of Shasta dam north of Redding, Cal. The Chicago, Rock Island & Pacific, completing a line revision and grade reduction project between Mercer, Mo., and Mill Grove, placed 15 miles in service, while 19 miles, all in West Virginia, is the aggregate of four separate lines to reach newly developed coal mines in that state.

Slightly less than one mile was constructed in Canada, this line also being projected to reach a colliery in British Columbia. No new lines were completed in Mexico, where construction work of any magnitude is practically at a standstill, although several ambitious projects are under consideration.

Multiple Track Mileage

There was a sharp increase in the construction of second-track, the mileage having increased from 8.29 miles in 1941 to 24.23 miles in 1942. This latter total was made up of 7.10 miles between Micheaud, La., and Gentilly, and 3.08 miles from Welka, Ala., to Flomaton, both on the Louisville & Nashville; 6.67 miles completed by the Pennsylvania between Smithboro, Ill., and Stubblefield; and two short stretches, on the Southern Pacific, at Echo, Tex., and Highbridge, the mileage being 1.57 and 0.95, respectively. The remainder was made up of small amounts, mostly in connection with other work.

In 1942, only 0.06 mile of third track was completed, and no fourth track was constructed by any road in the United States, Canada or Mexico. During the year, however, a relatively large number of installations of centralized traffic control have been completed, and others are still in progress, some of which are making the construction of additional main tracks unnecessary.

Early in 1940, a new class of track construction made its appearance which was greatly expanded during 1941 and was again in evidence on a large scale throughout 1942. These are tracks that have been or are being built to training camps, munitions factories, other war industries, ordnance depots, arsenals, air fields and fortified areas. In some instances, in the beginning, the railways from which these military lines branch, built the new tracks; in others they were built only to the property line of the reservation; and in still others the entire construction was undertaken by the army or the navy. During 1942, as the army became better organized to handle work of this character, practically all such projects have been built by contractors working directly under the Corps of Engineers. While most of this work has been completed, some projects are not yet finished, and it is likely that others will be initiated from time to time, as needs arise. A more detailed discussion of this subject appears in a separate article on another page of this issue.

Miscellaneous Construction

Obviously, in the main, the primary purpose of the construction undertaken during the year, as well as of most of that which was carried over from the previous year, was intended to facilitate the movement of cars through yards or of trains on the road. For this reason, additions to and rearrangements of yards, other yard improvements, the construction and extension of passing sidings, the relocation of passing sidings, the installation of centralized traffic control and the application of remote-control switches had a large place in the programs of many roads.

Among the larger projects completed or still under way at the end of the year, the Norfolk & Western completed the extension to its yard at Roanoke, Va.; the Chesapeake & Ohio continued work on the additional tunnel it is constructing at the summit of the Blue Ridge mountains, near Afton, Va.; the Chicago, Burlington & Quincy completed a westbound hump and classification yard in its yard at Galesburg, Ill.; the Chicago, Milwaukee, St. Paul & Pacific and the Chicago, Rock Island & Pacific, jointly, are constructiing a new entrance into Kansas City, which involves a high-level bridge over the Missouri river; the Gulf Coast Lines continued work on the high-level crossing over the Morganza floodway, near Krotz Springs, La.; the St. Louis-San Francisco had under construction 19 miles of relocated line in Oklahoma to replace lines to be submerged by the Denison dam; the Southern Pacific lengthened 85 passing sidings on various parts of its system; the Union Pacific was extending 31 passing sidings and installing centralized traffic control on 171 miles of line between Las Vegas, Nev., and Yermo, Cal. The Long Island has two important track elevation projects, one at Rockaway Beach, L. I., to eliminate 41 crossings, and another at Rosedale which will eliminate 12 crossings, work on the latter of which has been suspended owing to war conditions; and the New York Central completed its track elevation through Dunkirk, N. Y., and continued work on its line revision through Herkimer, N. Y.

In the foregoing list only projects costing individually more than $1,000,000 have been mentioned, while those included range up to approximately $5,000,000. A still larger number of projects range between $500,000 and $1,000,000. The tabulation which accompanies this article lists all projects costing $100,000 or more.

Although railway officers were becoming aware of how completely outmoded some of their stations are, and while a number of important jobs of stations modernization were carried over from the previous year, none were of a magnitude to cost more than $100,000, and work of this character is not being prosecuted with the same vigor as it was previously, owing to labor and material shortages. On the other hand, not a few situations arose during the year which required extensive modernization or replacement of both passenger and freight stations, in connection with war industries, training camps and other military activities.

While considerable construction has been carried on in Canada, these projects have been confined largely to those that will facilitate the movement of traffic or to replace structures that have become inadequate to meet requirements or that have been destroyed by fire. Con-

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1937	30,349	12,695
1932	22,046	10,265
1922	16,188	7,479

freight train-hour, speaks for itself. The record has been broken year after year for several years, was broken in 1941, and again in 1942.

Table XIX shows the average daily performance in miles run, of active locomotives and freight cars. Active locomotives are serviceable units, less those reported as stored. Active freight cars are serviceable units, less surplus units.

The fine achievement of rail carriers in 1941 and 1942, in respect of these factors of equipment performance, is brought out in this table. Both years showed record-breaking results.

The next table, Table XX, shows the average speed of freight and passenger trains, in miles per hour. These

Table XIX. Locomotive and Car Performance

	Miles per day per active unit		
Year	Freight Locomotives	Passenger Locomotives	Freight Cars
1942 (10 mos.)	122.5	204.5	50.6
1941	116.4	195.6	45.7
1940	107.5	190.8	42.2
1939	104.0	184.2	41.3
1938	99.3	178.6	39.0
1937	104.5	177.0	40.6
1932	86.2	161.5	34.0
1922	79.3	140.3	29.6

averages are not measurements of the running speed of trains while in motion, but takes into account total elapsed time between terminals.

After attaining an average freight train speed of 16.7 miles per hour in 1939 and 1940, the carriers showed a slight reduction to 16.5 miles in 1941, and another reduction to 15.9 miles in 1942. These decreases of the last two years are attributable to increasing density of traffic, and to the great increase in the average freight trainload. For example, traffic density increased from 4,792 net ton-miles per mile of road in 1940 to 8,060 in

Table XX. Average Train Speed

Year	Freight trains	Passenger trains (locomotive propelled)
1942 (10 mos.)	15.9	37.2
1941	16.5	37.6
1940	16.7	37.3
1939	16.7	36.9
1938	16.6	36.2
1937	16.1	36.0
1932	15.5	a
1922	11.1	a

a, Not reported.

1942, or 68 per cent, while the average trainload increased from 849 to 1,030 tons, or more than 21 per cent.

Heavy passenger traffic led also to a slight decrease in the average speed of passenger trains. The average for 1942 was, however, almost the same as in 1940, and was an improvement over all years of record prior to 1940. Here, again, the trainload has increased markedly. Passenger occupancy per train, which averaged 60.7 in 1940, increased to 73.2 in 1941, and increased again by a large upward surge to 115 in 1942. The rate of increase from 1940 to 1942 was 90 per cent.

Table XXI shows the growing load per freight train and per freight car. All trainload records were surpassed in 1942, and by a wide margin. The carload average was also a record.

The final table, dealing with economy, shows statis-

Table XXI. Average Freight Train and Car Load

Year	Net tons per train	Net tons per car
1942 (10 mos.)	1,030	31.5
1941	915	28.5
1940	849	27.6
1939	813	26.9
1938	759	26.1
1937	796	27.1
1932	663	24.9
1922	676	26.9

tics of locomotive fuel performance. These appear in Table XXII.

Here, again, was operating economy of a high order. Fuel performance in freight broke all records by a con-

Table XXII. Locomotive Fuel Performance

Year	Gross ton-miles per ton of fuel (freight service)	Passenger train car-miles per ton of fuel (passenger service)
1942 (10 mos.)	18,398	134
1941	18,091	134
1940	17,839	133
1939	17,774	135
1938	17,462	134
1937	17,133	133
1932	16,245	134
1922	12,273	112

siderable margin, and in passenger service was close to record levels.

Safety

The great increase in freight and passenger traffic on the railroads in 1942 necessitated the running of many more trains, the handling of many more cars, and a heavier loading per car and per train—both freight and passenger. Inevitably, this greater density of activity on the road, in yards, and in shops was accompanied by an increase in accidents, both numerically and relatively.

To appraise the accident statistics for 1942 in proper perspective, they should be compared with a period of somewhat similar density conditions. The year 1929, which marked the pre-war peak and the final year of the boom following the first World War, most nearly meets the qualification, although in terms of ton-miles and passenger-miles performed it fell considerably short of 1942.

The following table takes the first 10 months of 1929 as 100 in each case, and shows the corresponding index for the first 10 months of 1942.

Item	1929 (10 months)	1942 (10 months)
Number of train accidents	100	74
Employee fatalities	100	68
Employee injuries	100	54
Passenger fatalities	100	115
Passenger injuries	100	95
Total fatalities	100	82
Total injuries	100	58

Conclusion

Railroads did an excellent war job in 1942. This statement has support from every war agency, and from all classes of the public. Paraphrasing a brief summary of 1941 operations in our review of that year, the railroad story of 1942 consisted largely of accomplishment

and preparation: Accomplishment, in moving the greatest volume of freight and passenger traffic in history without serious shortage or congestion; preparation, for the still greater volume of traffic demand in 1943.

How much greater will that 1943 demand be, and will the railways be able to supply it satisfactorily? To this question all interested observers were seeking an answer as the year 1942 drew to a close.

Opinions differ considerably on the probable volume of rail traffic in 1943. Some believe that the reduction in construction, together with drastic reductions in civilian purchases and consumptions (enforced in part by rationing, and in part by the scarcity of goods), will more than offset the increase in production for the war effort, and that the total volume of freight traffic in 1943 will not exceed that of 1942, if in fact it equals it.

Others, including the writer, hold the opinion that the aggregate production effort of the nation will be greater in 1943 than in 1942, and that this will spell a larger aggregate volume of freight movement. Civilian production will decline, but will be more than made up by a rise in war production. If present war plans are carried out, iron and steel output will be larger, coal production will go up, and the movement of food materials and other products to the ports will increase. In addition, the motor truck situation will probably not improve, due to growing shortages of new replacements, parts and repair materials, and rubber. These indications, together with the expected rise in the Federal Reserve Board index of industrial production, point to more freight traffic for the rails. As to the extent of the increase in such traffic, no exact forecast is available, although an estimate of 10 per cent is suggested.

As to passenger traffic by rail in 1943, observers generally agree that the potential *demand* for rail service will increase, as it increased by rapid and accelerating steps in 1942. The extent to which rail passenger equipment and motive power can be made available to meet the demand is not so clear. The somewhat greater military or troop movements will be handled first, and civilian demands will next be met, to the limit of available facilities. The total possible demand for passenger service in 1943 may be measured by multiplying the actual maximum monthly movement in 1942 by 12. That movement of more than 5½ billion passenger-miles is equivalent to a year's aggregate of 65 to 70 billion. The actual rate of increase, 1943 over 1942, may run anywhere from 10 to 20 or more per cent.

One fact emerges from these varied opinions. Whatever the traffic demand in 1943, and whatever the load thrown upon them, rail carriers will need to exercise the greatest efficiency, if the transportation phase of the war effort in this most critical year of the conflict is to be handled as it should be. This efficiency requirement will apply to every phase of operation, including the maximum possible utilization of plant, equipment, and machinery, and the most effective performance of management and personnel. It seems reasonable to conclude, however, on the basis of past performance, that the growing war task will be met. This will be true not only in 1943 as it was in 1942, but will run also throughout as many more and later years as the present conflict may continue.

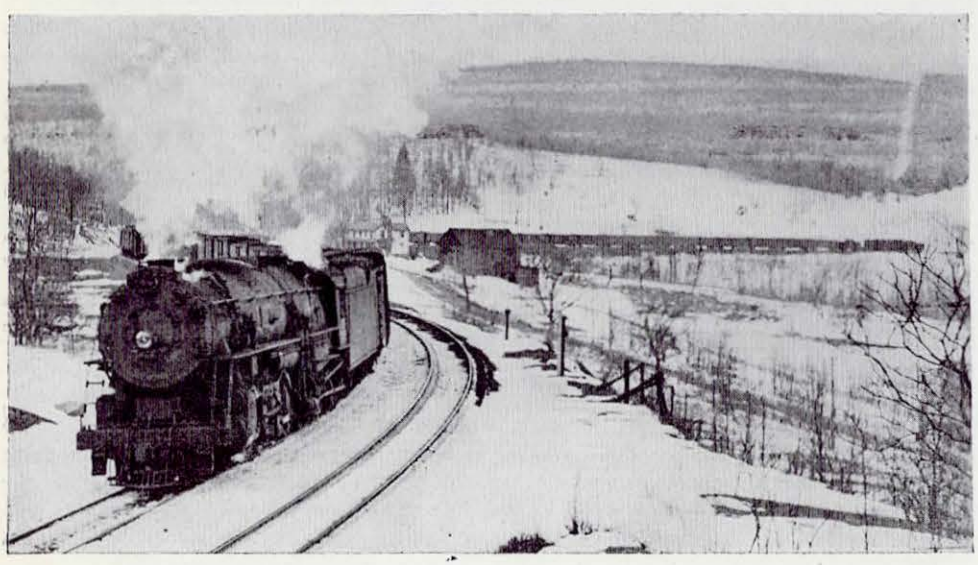
Manpower—Scarcer All the Time

(*Continued from page 45*)

ing of physical requirements, within limits; the retention in the service of those men reaching retirement age, if physically fit; the provision of adequate housing and boarding facilities where essential and not now available, and improvement in the normal housing and food of existing labor gangs; more widespread and intensive use of power tools and work equipment; the deferment of all work not essential to the war-time traffic requirements of the country; requests for the deferment of their most important, or key, men from military service; and, as was done on a large scale during the last war, the importation of labor. These same studies indicate that the solution to the problem is not to be found in higher wages, except in special cases, since the railways cannot hope to compete with war industries for men on a wage basis; and that, insofar as strenuous physical work is concerned, especially outside work, the solution is not to be found in recalling pensioned employees back into service or in the employment of women.

In the face of the fact that many essential industries of the country face manpower shortages, and estimates that there is already a shortage of 500,000 employees in all classes of industry in the western part of the country alone, it appears certain that, in spite of the effective adaption of all other expedients, the railway maintenance forces will not be able to secure the men they will require for essential work in 1943, unless the over-all labor pool of the country is increased.

* * *



A Delaware, Lackawanna & Western Freight, With Helper at Its Rear, Ascends the Eastern Slope of the Poconos

Yard Improvements Had a Large Place in the Construction Programs in 1942

Railway Construction Makes Large Gain in 1942

Many new projects carried out to meet war needs and to handle the record-breaking traffic that is now moving

By George E. Boyd

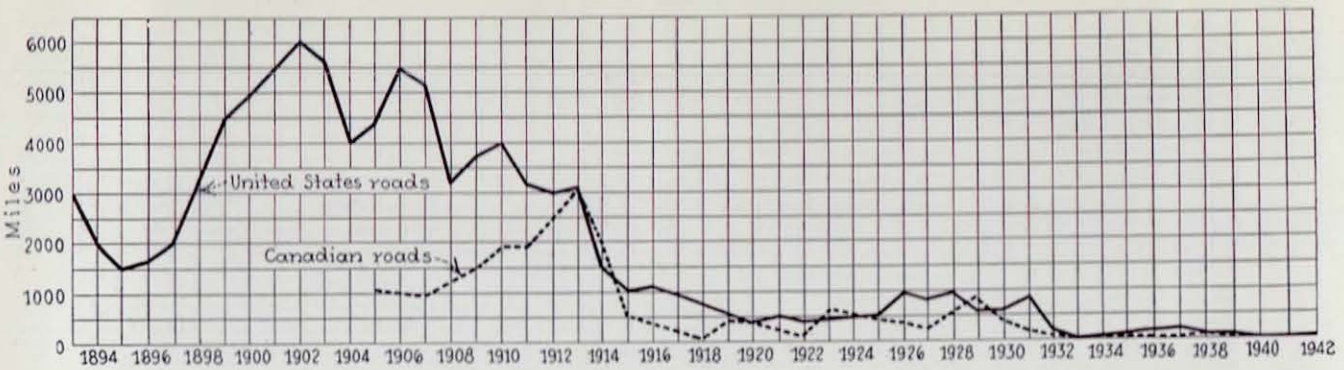
Associate Editor

IN an atmosphere reminiscent of a quarter-century ago, but in the midst of feverish activity, both military and industrial, that has been more extensive and at the same time more intensive than at any time during World War I, the railways have carried on a program of construction, during 1942, that was larger than for any year since 1930, in which year the all-time high in railway internal improvements was reached. As ton-miles (and passenger miles as well) reached the highest level in history, expansion and improvements in a wide range of railway facilities became necessary to insure the prompt movement of a traffic that brooked no delay. These projects, a large percentage of which were carried to completion during the year, were carried out despite an increasingly acute shortage of labor and a system of war priorities that often made the procurement of essential materials all but impossible.

In view of the political, economic, civilian and industrial dislocations that have already taken place, and of others of similar magnitude that are likely to occur with equal rapidity as the war progresses, it is not safe to predict events very far in advance. However, all present indications point to further increases in traffic

Miles of Main Track Built in the United States in 1942

State	Number of companies building	First track	Second track	Third track	Fourth track	Total
Alabama	1	....	6.00	....	....	6.00
California	1	30.09	0.27	....	....	30.36
District of Columbia	1	....	1.40	....	....	1.40
Illinois	1	....	6.67	....	....	6.67
Louisiana	1	....	7.10	....	....	7.10
Missouri	1	15.10	....	....	....	15.10
Montana	1	7.21	....	....	....	7.21
Oregon	1	....	0.06	....	....	0.06
Pennsylvania	3	2.50	0.21	....	....	2.71
Texas	1	....	2.52	....	....	2.52
Virginia	1	....	....	0.06	....	0.06
West Virginia	3	18.67	....	....	....	18.67
Total		73.57	24.23	0.06	....	97.86



New Lines Constructed in the United States in 1942 Aggregated 74 Miles. Canada Completed only One Mile

and still greater activity in railway construction in 1943, primarily to expand or improve existing facilities or to provide additional facilities that are essential to the expeditious handling of traffic.

Although 1930 was a record year with respect to volume of railway construction, most of the work in progress during that year consisted of completing projects that had been started or were well under way when the disaster of 1929 overtook the country. Between 1930 and 1941 no general and little local expansion of the railway plant occurred and likewise practically no construction of consequence in the way of internal improvements was undertaken. While there were several reasons for this, the primary one was that earnings remained consistently at so low a level that, with only a few exceptions, it became practically impossible to finance projects of any considerable magnitude. Of only slightly less weight, during this period economic conditions were so disturbed and uncertain that there was little incentive to make commitments for a future that no one could foresee.

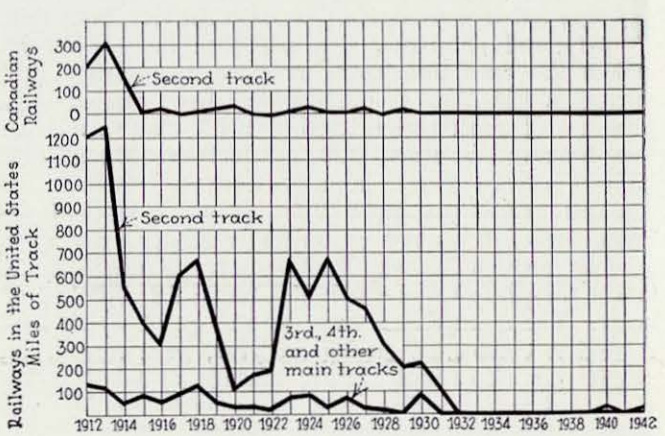
Yet, during this same period, radical changes occurred in both traffic and operation. So completely were the methods of operation changed, and so insistent became the demands for faster service that not a few of the facilities that were the latest word in design and favorable operating characteristics at the beginning of the depression became outmoded, while many of those that were constructed earlier were seriously out of date. As traffic increased in 1941, railway operation was severely handicapped by these outmoded facilities, and there

Miles of New Lines Completed in the United States Since 1830

Year	Miles	Year	Miles
1830	40	1886	8,400
1831	99	1887	13,081
1832	191	1888	7,066
1833	116	1889	5,707
1834	214	1890	5,739
1835	138	1891	4,620
1836	280	1892	4,648
1837	348	1893	3,024
1838	453	1894	1,760
1839	386	1895	1,420
1840	491	1896	1,692
1841	606	1897	2,109
1842	505	1898	3,265
1843	288	1899	4,569
1844	180	1900	4,894
1845	277	1901	5,368
1846	333	1902	6,026
1847	263	1903	5,652
1848	1,056	1904	3,832
1849	1,048	1905	4,388
1850	1,261	1906	5,623
1851	1,274	1907	5,212
1852	2,288	1908	3,214
1853	2,170	1909	3,748
1854	3,442	1910	4,122
1855	2,453	1911	3,066
1856	1,471	1912	2,997
1857	2,077	1913	3,071
1858	1,966	1914	1,532
1859	1,707	1915	933
1860	1,500	1916	1,098
1861	1,016	1917	979
1862	720	1918	721
1863	574	1919	686
1864	947	1920	314
1865	819	1921	475
1866	1,404	1922	324
1867	2,541	1923	427
1868	2,468	1924	579
1869	4,103	1925	644
1870	5,658	1926	1,005
1871	6,660	1927	779
1872	7,439	1928	1,025
1873	5,217	1929	666
1874	2,584	1930	513
1875	1,606	1931	748
1876	2,575	1932	163
1877	2,280	1933	24
1878	2,428	1934	76
1879	5,006	1935	45
1880	6,876	1936	93
1881	9,789	1937	148
1882	11,599	1938	38
1883	6,819	1939	58
1884	3,974	1940	26
1885	3,131	1941	54
		1942	74

Miles of New Lines Completed in Canada Since 1904

Year	Miles	Year	Miles
1904	316	1923	655
1905	1,181	1924	615
1906	1,007	1925	414
1907	976	1926	335
1908	1,249	1927	310
1909	1,488	1928	723
1910	1,844	1929	841
1911	1,898	1930	285
1912	2,232	1931	250
1913	3,013	1932	121
1914	1,978	1933	0
1915	718	1934	1
1916	290	1935	2
1917	207	1936	1
1918	135	1937	0
1919	433	1938	101
1920	305	1939	1
1921	252	1940	2
1922	145	1941	1
		1942	1


Canadian Railways
Second track
Railways in the United States Miles of Track
Second track
3rd., 4th. and other main tracks
1912 1914 1916 1918 1920 1922 1924 1926 1928 1930 1932 1934 1936 1938 1940 1942

Only 24 Miles of Multiple Tracks Were Completed in 1942

was an immediate revival of construction activity, although the new work that was then undertaken by no means kept pace with operating needs.

At the beginning of 1942, therefore, faced with the largest traffic in their history, and with the need for expediting its movement to a greater degree than ever before, it became necessary not only to replace the older facilities with others that are designed to make the newer methods of operation fully effective, but also to expand other facilities or build entirely new ones to obtain the capacity needed to handle the unprecedented volume of traffic that must be cared for. For these reasons, construction programs for last year were, in effect, a continuance of those initiated in 1941, but on a considerably larger scale. On the other hand, despite this greater activity, few roads were able to do all of the work they had planned to do at the beginning of the year, or that they felt that they needed; in fact, most of them fell far short of this objective.

It is widely recognized that even under the most favorable circumstances railway facilities suffer from a high rate of obsolescence, but partly because of the virtual suspension of construction during the depression years and more particularly because of the radical changes that occurred in operating methods, more railway facilities were obsolete at the beginning of 1942 than at any previous time. Although the demands that were imposed on these facilities made it imperative that immediate steps be taken to correct the deficiencies in some of them, and despite the number of projects and the magnitude of the construction programs that have been undertaken during the last two years with this purpose in view, the surface has scarcely been scratched and there still remains a need for a vast program of construction and reconstruction that will affect every type of railway facility and that will overshadow all former programs.

There are ample indications that traffic will not fall below its present levels during 1943, but that it will increase as increased production of arms, ammunition, equipment and other supplies becomes necessary to fill the needs of our armies on far-flung and active battle fronts. With earnings equal to or greater than those for the year that has just closed, and in view of the pressing need for more modern facilities and for additional facilities for handling expeditiously the traffic that must be moved, the prospect is that there will be still greater activity during the coming year and that there will be a further increase in the number of more important projects, as there has already been in those of smaller magnitude. In other words, with traffic continuing at or above its present level, and with the necessary funds more easily available, construction activity will increase, for there is still a suppressed need for a vast and widespread program of improvements that must be met if the railways are to continue to handle satisfactorily the unprecedented volume of traffic that is being offered to them.

Marked Increase in Construction

During 1942 there was a marked increase in construction projects of every kind and magnitude. In the railway field these projects fall into two groups regardless of other classifications, that is, those that can be paid for out of current revenues, and those of greater magnitude that must be financed with borrowed funds. Reports from all sources indicate that more projects falling in the first group were undertaken in 1942 than for many years. In fact, these smaller projects account for considerably more than half of the capital expenditures applied in making improvements to the fixed property. There was also a marked increase in the larger projects, so that the total expenditures for new and improved facilities will be greater than for any year since 1931. However, this increase is reflected to only a limited extent in the tabulation that follows this article, since it includes only those projects, except grade-crossing eliminations, that cost approximately $100,000 or more.

During 1942, grade-crossing eliminations continued to represent a major item in the construction programs of many roads, although in all but a few cases the work is being done by or under the supervision of state highway officers, largely with funds provided through federal appropriations. This activity is not confined to particular railways or to any particular section, but is distributed generally throughout the country, the allotment of funds being based partly on the density of population and partly on the mileage of roads in each of the respective states. During the seven years that the present campaign of grade-crossing eliminations has been under way, a large number of projects have been completed, much to the benefit of users of the highways. In the beginning, however, less care was exercised in selecting the projects to be undertaken. Today, the selection is being made on the basis of maximum benefits, for which reason the number selected annually is somewhat smaller than at first, while the cost of the individual projects is somewhat greater, although low-cost projects are by no means ignored. Most of the projects under way during the year have been completed, although some of the larger jobs are being carried over into the new year. In a few cases, it has been necessary to suspend work temporarily or for the duration of the war by reason of inability to obtain the necessary structural steel.

New Line Mileage Increases

It has been noted for many years that there is a definite relation between external and internal improvements; in other words, the mileage of new lines under construction or completed in any year provides an excellent index of railway construction activities as a whole, and this belief is borne out by analysis of construction records over a long period. Surprising as it may seem, this rule holds good during periods of sharply curtailed construction as well as during more active periods. Confirming this trend, 74 miles of new lines were completed during 1942. While this mileage is insignificant when compared with the 11,599 miles completed in 1881 and the 13,081 miles completed in 1887, it is 37 per cent more than was completed in 1941 and more than 2¾ times as much as in 1940, before the present unprecedented rise in traffic. In this connection, it is of interest that several projects of considerable magnitude are now under way and that others are being held in abeyance to permit the prosecution of other improvements that demand more immediate attention. The largest of these is a line being built by the Alaska, between Whittier and Portage, 12.5 miles, including dock and terminal facilities at Whittier, at a cost of $5,300,000.

During the 20-year period ending with 1922, the mileage of new lines completed annually varied from 314 miles in 1920 to 5,652 miles in 1903, the former being the smallest mileage recorded up to that time since 1847, when the long period of railway expansion was beginning to get under way. In contrast, during the 20-year period ending with 1942, the largest mileage

completed in any year was in 1928, when 1,025 miles of line were placed in operation, and the smallest was the 24 miles completed in 1933, which was also the least mileage recorded in a single year since the first railway was constructed in 1830.

It is of more than passing interest that the aggregate mileage during the first period was 51,987, while that for the second period was only 7,185, for it is significant that the average mileage completed year by year during the earlier period was 2,599 miles, while the average for the two decades just closed was only 359 miles. These figures provide the strongest possible evidence that the days of large external developments are past and that future expenditures will be applied more and more for internal improvements and for expansion of those facilities that will expedite the movement of traffic.

Of the 74 miles of new lines placed in service during the year, 30 miles represented the relocation of the tracks of the Southern Pacific to replace tracks that will be submerged by the pool back of Shasta dam north of Redding, Cal. The Chicago, Rock Island & Pacific, completing a line revision and grade reduction project between Mercer, Mo., and Mill Grove, placed 15 miles in service, while 19 miles, all in West Virginia, is the aggregate of four separate lines to reach newly developed coal mines in that state.

Slightly less than one mile was constructed in Canada, this line also being projected to reach a colliery in British Columbia. No new lines were completed in Mexico, where construction work of any magnitude is practically at a standstill, although several ambitious projects are under consideration.

Multiple Track Mileage

There was a sharp increase in the construction of second-track, the mileage having increased from 8.29 miles in 1941 to 24.23 miles in 1942. This latter total was made up of 7.10 miles between Micheaud, La., and Gentilly, and 3.08 miles from Welka, Ala., to Flomaton, both on the Louisville & Nashville; 6.67 miles completed by the Pennsylvania between Smithboro, Ill., and Stubblefield; and two short stretches, on the Southern Pacific, at Echo, Tex., and Highbridge, the mileage being 1.57 and 0.95, respectively. The remainder was made up of small amounts, mostly in connection with other work.

In 1942, only 0.06 mile of third track was completed, and no fourth track was constructed by any road in the United States, Canada or Mexico. During the year, however, a relatively large number of installations of centralized traffic control have been completed, and others are still in progress, some of which are making the construction of additional main tracks unnecessary.

Early in 1940, a new class of track construction made its appearance which was greatly expanded during 1941 and was again in evidence on a large scale throughout 1942. These are tracks that have been or are being built to training camps, munitions factories, other war industries, ordnance depots, arsenals, air fields and fortified areas. In some instances, in the beginning, the railways from which these military lines branch, built the new tracks; in others they were built only to the property line of the reservation; and in still others the entire construction was undertaken by the army or the navy. During 1942, as the army became better organized to handle work of this character, practically all such projects have been built by contractors working directly under the Corps of Engineers. While most of this work has been completed, some projects are not yet finished, and it is likely that others will be initiated from time to time, as needs arise. A more detailed discussion of this subject appears in a separate article on another page of this issue.

Miscellaneous Construction

Obviously, in the main, the primary purpose of the construction undertaken during the year, as well as of most of that which was carried over from the previous year, was intended to facilitate the movement of cars through yards or of trains on the road. For this reason, additions to and rearrangements of yards, other yard improvements, the construction and extension of passing sidings, the relocation of passing sidings, the installation of centralized traffic control and the application of remote-control switches had a large place in the programs of many roads.

Among the larger projects completed or still under way at the end of the year, the Norfolk & Western completed the extension to its yard at Roanoke, Va.; the Chesapeake & Ohio continued work on the additional tunnel it is constructing at the summit of the Blue Ridge mountains, near Afton, Va.; the Chicago, Burlington & Quincy completed a westbound hump and classification yard in its yard at Galesburg, Ill.; the Chicago, Milwaukee, St. Paul & Pacific and the Chicago, Rock Island & Pacific, jointly, are constructing a new entrance into Kansas City, which involves a high-level bridge over the Missouri river; the Gulf Coast Lines continued work on the high-level crossing over the Morganza floodway, near Krotz Springs, La.; the St. Louis-San Francisco had under construction 19 miles of relocated line in Oklahoma to replace lines to be submerged by the Denison dam; the Southern Pacific lengthened 85 passing sidings on various parts of its system; the Union Pacific was extending 31 passing sidings and installing centralized traffic control on 171 miles of line between Las Vegas, Nev., and Yermo, Cal. The Long Island has two important track elevation projects, one at Rockaway Beach, L. I., to eliminate 41 crossings, and another at Rosedale which will eliminate 12 crossings, work on the latter of which has been suspended owing to war conditions; and the New York Central completed its track elevation through Dunkirk, N. Y., and continued work on its line revision through Herkimer, N. Y.

In the foregoing list only projects costing individually more than $1,000,000 have been mentioned, while those included range up to approximately $5,000,000. A still larger number of projects range between $500,000 and $1,000,000. The tabulation which accompanies this article lists all projects costing $100,000 or more.

Although railway officers were becoming aware of how completely outmoded some of their stations are, and while a number of important jobs of stations modernization were carried over from the previous year, none were of a magnitude to cost more than $100,000, and work of this character is not being prosecuted with the same vigor as it was previously, owing to labor and material shortages. On the other hand, not a few situations arose during the year which required extensive modernization or replacement of both passenger and freight stations, in connection with war industries, training camps and other military activities.

While considerable construction has been carried on in Canada, these projects have been confined largely to those that will facilitate the movement of traffic or to replace structures that have become inadequate to meet requirements or that have been destroyed by fire. Con-

struction in Mexico has remained practically at a standstill, the only major project reported was the construction of a new freight yard at Monterrey, N. L., by the National of Mexico. A new-line project of considerable magnitude is the proposed extension of the Kansas City, Mexico & Orient between Creel, Chihuahua and San Pedro, Sinaloa, 159 miles. The location surveys have been completed for a line along the Septentrion river, which will provide a through route for this road to the west coast of Mexico.

During the year, abandonments of existing lines became so widespread and aggregated so large a mileage that they are being treated as a separate subject and are discussed in an independent article which appears on another page of this issue.

Following is a detailed report by roads of construction projects completed during 1942 or still in progress at the end of the year, the individual cost of which approximates or exceeds $100,000, except grade separations, which are recorded regardless of cost:

Railway Construction in the United States

(Figures in parentheses indicate percentage of completion at the end of 1942)

Alaska

New Road Under Construction: Whittier, Alaska to Portage, 12.50 miles, including dock, yard and terminal facilities at Whittier, $5,300,000 (track and tunnels 100 and terminal facilities 10).

Important Work Undertaken: Construction of warehouse and rearrangement of tracks, Anchorage, Alaska, $147,500 (100). Construction of passenger station and general office building, Anchorage, Alaska, $261,000 (100). Replacement of timber trusses with steel spans, Indian river, Canyon, Alaska, $114,650 (100). Construction of coal washing plant and power house, Eska, Alaska, $170,500 (80).

Atchison, Topeka & Santa Fe

Grade Crossing Elimination: Subway: Pauline, Kan. (45).

Important Work Undertaken: Alterations to yard, Belen, N. Mex. (100). Installation of additional stone ballast, Barstow, Calif., to Oro Grande (100). New freight classification yard, San Diego, Cal. (100).

(Gulf, Colorado & Santa Fe) Overcrossings: Zang Blvd., Dallas, Tex. (30). Brownwood, Tex. (75).

Alton

Grade Crossing Elimination: Relocation of highway and construction of subway to eliminate three grade crossings, Carlinville, Ill., $94,000 (100).

Alton & Southern

Important Work Undertaken: 5,000,000 bushel grain elevator and storage tracks, East St. Louis, Ill., $570,538 (100). Construction of interchange track and installation of automatic interlocker with Terminal Railroad Association, East St. Louis, Ill., $109,700 (20).

Apache

Grade Crossing Elimination: Relocation of Highway: To eliminate 2 grade crossings between Snowflake, Ariz., and Holbrook (100).

Atlantic Coast Line

Grade Crossing Elimination: Subway: National Park, Petersburg, Va., $100,000 (25).

Important Work Undertaken: Second track on Petersburg Belt Line, Petersburg, Va., 3.62 miles, $159,000 (15).

Baltimore & Ohio

Second Track: Chesapeake Junction, D. C., to Benning, 1.4 miles, $136,000 (100).

Grade Crossing Elimination: Overcrossings: 9th street, joint with Penna., Washington, D. C., $475,000 (100). Branchville, Md., $150,000 (100). Webster, W. Va., $150,000 (100). Norton, W. Va., $145,000 (100). Strasburg, Ohio, $220,000 (100). Mansfield, Ohio, $255,000 (75).

Subways: Port Columbus, Ohio, $350,000 (25). Track elevation, Grant City, Staten Island, N. Y., to Bay Terrace, joint with state, $3,800,000 (20—work suspended temporarily). Elevation of Market street extension, McKeesport, Pa., $270,000 (100).

Important Work Undertaken: Rehabilitation of Alexandria branch as part of emergency bridge route, Shepherd, D. C., to Benning, $689,000 (15). Improved terminal facilities, Cowen, W. Va., $495,000 (70). Strengthening bridges, W. Va., and Pittsburgh branches, $600,000 (100). Protection of roadbed along pool formed by Mahoning dam, Smicksburg, Pa., to Loop, $415,000 (100). Construction of Coleman branch, Listie, Pa., $565,000 (100). Reconstruction of Bridge 49-56, Mt. Sterling, Ohio, $110,000 (90). Changes made necessary by flood protection project, Massillon, Ohio, $150,000 (75). Additional tracks, Mill Creek yard, Cincinnati, Ohio, $250,000 (100). Placing present non-operating swing bridge in operation, McCook, Ill., $175,000 (25).

Bessemer & Lake Erie

Second Track: At Coolspring, Pa., 0.21 miles.

Important Work Undertaken: Enlarging Winding Basin in Harbor at Conneaut, Ohio, $164,000 (100). Track changes and installation of C.T.C., Filer, Pa. to Meadville Junction, $340,000 (100).

Boston & Maine

Grade Crossing Elimination: Overcrossing: Hoyt's and Folsom's crossings, Orange, Mass., $68,000 (100).

Subway: Davis Gate crossing, Harvard, Mass. (100).

Canadian National (Lines in the United States)

Grade Crossing Elimination: Overcrossing: Fort Custer drive, Battle Creek, Mich. (100).

Subway: Six Mile road, Detroit, Mich. (100).

Important Work Undertaken: Steel and concrete bridge over tracks of Pennsylvania and Baltimore & Ohio Chicago Terminal on 49th street line to replace pile trestle, Chicago, Ill. (100).

Central of Georgia

Grade Crossing Elimination: Overcrossings: Wise, Ga., Bibb county, $133,000 (100). Dover, Ga., Screven county, $30,000 (90). Childersburg, Ala., Talladega county, $61,000 (100). McIntyre, Ga., Wilkinson county, $82,000 (100).

Central of New Jersey

Grade Crossing Elimination: Overcrossing: West avenue, Sewaren, N. J., $303,000 (100).

Important Work Undertaken: Improvements to freight terminal yard, Jersey City, N. J., $400,000 (100).

Chesapeake & Ohio

New Road Under Construction. Colts Branch, Quinwood, W. Va., 5.5 miles.

Grade Crossing Elimination: Overcrossings: South Charleston, W. Va., $206,000 (90). LeMoyne, Ohio, $287,000 (100).

Relocation of Highway: Relocate State Route 31 including construction of overhead bridge, Pratt, W. Va., to Hansford, $200,000 (100).

Important Work Undertaken: Revision of grade and alinement to retire Greenwood Tunnel, Greenwood, Va., $232,000 (90). Revision of line and grade and construction of second Blue Ridge Tunnel, Afton, Va., $1,530,200 (50). Extension of 5 tracks in eastbound receiving yard, Clifton Forge, Va., $147,950 (94). Extension of east and westbound passing sidings; extension of bridge and construction of additional yard tracks, Quinnimont, W. Va., $166,495 (98). Construction of main supply track, including bridge, for new mine, Draffin, Ky., $663,000 (93). Additional team tracks including viaduct connection and unloading crane, Cincinnati, Ohio, $232,198 (98). Widening of south apron on Pier 8 and installation of apron track, Newport News, Va., $107,500 (100). Additional tracks, Fulton yard, Richmond, Va., $160,500 (100). Filling James River Canal, rearrangement of tracks and paving driveways, Richmond, Va., $164,350 (100). Extension of tracks in receiving yard, Newport News, Va., $125,000 (100). Widening apron on Pier 6 and dredging slip, Newport News, Va., $155,200 (100). Construction of 13 additional classification tracks, Newport News, Va., $160,775 (100). Improvement of car repair facilities and construction of additional test tracks, Newport News, Va., $133,815 (100). Installation of 2 cranes and construction of additional track on Pier 2 for handling ore, Newport News, Va., $328,000 (100). Construction of 12 additional storage warehouses, Morrison, Va., $390,000 (100). Construction of wye track and two 85-car setoff tracks, Lindsay, Va., $100,600 (100). Revision of alinement, Frazier, W. Va., $118,050 (100). Additional unit to company hospital, Huntington, W. Va., $172,000 (100). Construction of additional tracks, Ashland, Ky., $185,900 (100). New yard office building, construction of subway and installation of pneumatic tube transmission system, Russell, Ky., $164,000 (100). Installation of subdrainage, trench and rock backfill, Concord, Ky., $110,745 (100). Rearrangement of passing sidings and signals and installation of centralized traffic control, Stony Point, Ky., to Stevens and Carntown, Ky., to CS Cabin, $177,470 (100). Improvement in coal sprinkling facilities on dumpers, Presque Isle, Ohio, $135,000 (100).

Chicago & Illinois Midland

Grade Crossing Elimination: Overcrossings: Extension of approaches, Derry crossing, Menard county, Ill. (100). Tice, Ill., 3 grade crossings, abandoned (100). Kincaid, Ill., 2 grade crossings abandoned through abandonment of switching tracks (100).

Chicago & North Western

Grade Crossing Elimination: Overcrossing: Barr, Ill., $22,000 (40). Subways: Durand road, Willow, Wis., $200,000 (100). Westleigh road, Lake Forest, Ill., $450,000 (60). Touhy avenue, Park Ridge, Ill., $320,000 (100).

Relocation of Highway: Judson, Minn., $100 (100).

Important Work Undertaken: Facilities for servicing streamline trains, Chicago, Ill., $430,000 (100).

Chicago, Burlington & Quincy

Grade Crossing Elimination: Overcrossings: Oregon, Ill., $75,000 (20). Smithboro, Ill., $80,000 (100). New Milford, Ill., $120,000 (20). South of Pacific Junction, Iowa, $60,000 (100). East of Pacific Junction, Iowa, $60,000 (20). Burlington, Iowa, $100,000 (20). Red Oak, Iowa, $30,000 (100). Miner, Wis., $65,000 (100). St. Paul, Minn., $297,000 (100). Denver, Colo., $25,000 (100).

Subways: Brookfield, Mo., $300,000 (100). Denver, Colo., $50,000 (100).

Important Work Undertaken: Westward hump and classification yard, Galesburg, Ill., $1,044,181 (100). Consolidation and rearrangement of engine terminal facilities and trackkage, Beardstown, Ill., $245,368 (100). Widening double-track centers to provide better clearance for modern equipment, St. Louis, Mo., to Machnes, $218,041 (100). Raise track, reduce curvature and provide enlarged drainage openings for flood prevention, Table Rock, Neb., to Lincoln, $259,959 (100). Curve and grade reduction and additional trackage, Central Illinois strip mine territory,

$109,927 (100). Enlargement of enginehouse and construction of locker building for enginemen, Alliance, Neb., $99,918 (65).

(Fort Worth & Denver City) Overcrossing: State Route 18, Clarendon, Tex., $88,000 (100).

Important Work Undertaken: Revision of alinement including construction of 512-foot steel bridge over Cheyenne creek, Magenta, Tex., $300,000 (100).

Chicago, Milwaukee, St. Paul & Pacific

Grade Crossing Elimination: Overcrossings: United States Route 67, Bellevue, Iowa, $100,000 (100). State Route 30, Madison, Wis., $50,000 (30—work suspended temporarily). Reserve street, St. Paul, Minn. $108,000 (100). Mendota, Minn., $30,000 (work suspended temporarily). Route 19, Moore, Mont., $41,000 (100).

Subways: Willow road, Techny, Ill., $200,000 (5—work suspended temporarily). Hiawatha avenue, Chicago, Ill., $55,000 (5). Elko, Minn., $30,000 (5—work suspended temporarily). Nebraska street, Mobridge, S. D., $81,000 (5—work suspended temporarily). Hettinger, N. D., $211,000 (5—work suspended temporarily).

Relocation of Highways: United States Route 16, Draper, S. D., to Vivian, $80,000 (100). State Route 50, Wagner, S. D., to Lake Andes, $80,000 (100). United States Route 83, Temvik, N. D., to Linton, $70,000 (30—work suspended temporarily).

Reconstruction of Existing Grade Separation Structures: Bluff street, Janesville, Wis., $50,000 (100). Worley, Idaho, $14,000 (40—work suspended temporarily).

Important Work Undertaken: Relocation of main line and construction of bridge over Missouri river to provide new entrance into Kansas City, joint with C. R. I. & P. and K. C. S., Kansas City, Mo., $2,622,372 (12). Construction of spur to ordnance plant, Sauk City, Wis., $202,618 (100).

Chicago, Rock Island & Pacific

First Track: Mercer, Mo., to Mill Grove, 15.10 miles, $2,000,000 (98).

Grade Crossing Elimination: Overcrossings: State Route A, Larchwood, Iowa, $30,000 (100). State Route 218, joint with C. G. W., Faribault, Minn., $114,000 (100). Roosevelt road, Little Rock, Ark., $70,000 (65). United States Routes 81 and 66, El Reno, Okla., $201,000 (60). Joint with St. L.-S. F. and St. L.-Sw., Carrollton, Tex., $150,000 (80). Brandt st., M. P. 383.1, Mercer, Mo., $7,075 (100). (The following grade crossing eliminations are on new line between Mercer, Mo., and Mill Grove.) United States Route 65, M. P. 385.0, $12,369 (100). County road, M. P. 386.2, $5,828 (100). County road, M. P. 387.1, $8,601 (100). State Route 4, M. P. 391.4, $18,039 (100). County road, M. P. 392.1, $14,472 (100). County road, M. P. 396.7, $5,377 (100). Bridge over Wildcat Creek and United States Route 65, M. P. 391.8, $83,000 (100).

Subway: E. University avenue, joint with state highway commission, C. G. W., and Ft. D. D. M. & S., Des Moines, Iowa, $150,000 (100).

Reconstruction of Existing Grade Separation Structure: Reconstruction of subway bridge, United States Route 75, Sabetha, Kan., $30,000 (75).

Important Work Undertaken: Relocation of main line and construction of bridge over Missouri river to provide new entrance into Kansas City, joint with C. M. St. P. & P., and K. C. S., Birmingham, Mo., to Kansas City, $2,622,372 (10). Raising track including new bridge over Beaver Creek, Guymon, Okla., to Optima, $283,000 (50).

Chicago, St. Paul, Minneapolis & Omaha

Grade Crossing Elimination: Overcrossing: Forest st., St. Paul, Minn., $140,000 (100).

Subway: Worthington, Minn., $130,000 (100).

Clarendon & Pittsford

Grade Crossing Elimination: Two grade crossings eliminated by removal of siding, Proctor, Vt., $75 (100).

Columbus & Greenville

Important Work Undertaken: Track to serve Army Flying School, Valley Hill, Miss., $105,970 (100).

Delaware & Hudson

Grade Crossing Elimination: Construction of one grade crossing to replace two others, Whitehall, N. Y., $2,330 (100).

Important Work Undertaken: Improve shop facilities to handle new locomotives, Colonie, N. Y., $110,000 (100). Revision of grade and increase of clearance through tunnel, Tunnel, N. Y., $140,000 (100). Raising bridge over Barge canal and installing two additional spans, West Waterford, N. Y., $200,000 (100). Rearrangement of northbound receiving yard, Oneonta, N. Y., $121,000 (90).

Delaware, Lackawanna & Western

Grade Crossing Elimination: Overcrossing: Steel and concrete viaduct, Riverview Drive, Totowa Borough, N. J. (100).

Subway: Dansville-Conesus Highway, Dansville, N. Y. (100).

Reconstruction of Existing Grade Separation Structures: Reconstruction of overcrossing structure, revision of drainage and paving, Norwich-North Norwich Highway and North Norwich-Sherburne Highway, Galena, N. Y., (work suspended for duration of war because of steel shortage). (60).

Denver & Rio Grande Western

Grade Crossing Elimination: Overcrossings: Pando, Colo., including relocation of 1.3 miles of highway, $130,305 (100). 21st South st., Denver, Colo., $125,000 (started).

Subway: Altus, Utah, $32,000 (100). Park City Branch, 1.50 mile east of Altus, Utah.

Important Work Undertaken: Installing ballast, Helper, Utah to Gilluly, 70.7 miles, $269,000 (90). Construction of tracks, ice house and ice harvesting facilities, Kremmling, Colo., $117,000 (70). Extension of passing sidings, installation of 20 power switches and C. T. C., Chacra, Colo., to Tunnel, $304,000 (100).

Denver & Salt Lake

Grade Crossing Elimination: Overcrossing: Kremmling, Colo., $39,947 (100).

Duluth, Missabe & Iron Range

Important Work Undertaken: Addition of 10 stalls to enginehouse, Proctor, Minn., $345,000 (90).

Elgin, Joliet & Eastern

Grade Crossing Elimination: Subway: Warrenhurst, Ill., E. J. & E. proportion, $2,774 (100).

Erie

Grade Crossing Elimination: Overcrossings: State Route S-3, Bridge H-7.18, Rutherford, N. J. (25). State Route 171, Hoadleys, Pa. (90). State Route 501, Mansfield, Ohio (100).

Subway: Track elevation, Dunkirk, N. Y., to eliminate 2 grade crossings, joint with New York Central (100).

Reconstruction of Existing Grade Separation Structures: Bridge 39.32, Lakewood, N. Y. (95). Bridge H-39.69, Southfields, N. Y. (40).

Important Work Undertaken: Reconstruction of Pier 1, additional mooring rack and repairs to bulkhead, Jersey City, N. J. (100). Pump house, paint shop, carpenter shop, storehouse, machine and boiler shop on Pier 1, Jersey City, N. J., to replace like facilities appropriated by United States Navy at Weehawken, N. J. (50).

Great Northern

First Track: Marion, Mont., to Hubbard, 7.21 miles.

Grade Crossing Elimination: Overcrossing: Viaduct, Spokane St., Seattle, Wash., Great Northern portion $23,400 (100). Waite Park, Minn., $194,500 (100). Troy, Mont., $245,593 (100). Scenic, Wash., $7,777 (100). Concrete walk on bridge, Royalston Ave., Minneapolis, Minn., $275 (100).

Reconstruction of Existing Grade Separation Structures: Minnetonka Blvd., Minneapolis, Minn., $2,900 (100). Snelling Ave., St. Paul, Minn., $3,400 (100). Royalston Ave., Minneapolis, Minn., $12,100 (100). Kerkhoven, Minn., $1,940 (100). Replacing foot bridge, Minot, N. D., $9,435 (100). Replacing overhead bridge, St. Bonifacius, Minn., $13,600 (To be completed in 1943). Replacing overhead bridge, Broadway Ave., Minneapolis, Minn., $3,700 (100). Renewal of timber overhead bridge, West 57th St., Seattle, Wash., $3,800 (100). Wayzata Blvd., Minneapolis, Minn., $6,500 (100).

Important Work Undertaken: Reduction of curvature, widening embankments, installation of additional ballast and 112-lb. rail, Nickerson, Minn., to Foxboro, $342,775 (100). Reduction of curvature, widening embankments, installation of additional ballast and 112-lb. rail, Hutchinson Junction, Minn., to Delano, $450,265 (100). Installation of additional ballast and released rail, Dresden, N. D., to Hannah, $133,600 (100). Widening embankments, installation of additional ballast and released rail, Lester, Iowa, to Doon, $165,430 (100). Installation of additional ballast and heavier released rail, Niobe, N. D., to Lignite, $133,900 (100). Widening embankments, installation of additional ballast and heavier rail, Teton, Mont., to Carter, $166,850 (100). Widening embankments, installation of additional ballast and heavier rail, Geyser, Mont., to Moccasin, $229,000 (100). Installation of washed and screened gravel ballast, Kalispell division, Mont., $169,130 (100). Installation of washed and screened gravel ballast, Spokane division, Wash., $140,420 (90). Installation of ore steaming facilities, Allouez, Wis., $123,950 (100). Extension of yard, Minot, N. D., $157,600 (100). Additional yard tracks, South Klamath, Ore., $119,000 (100). Installation of additional ballast and 112-lb. rail, Foxboro, Minn., to Boylston, Wis., $178,750 (100). Installation of additional ballast and 112-lb. rail, Palermo, N. D., to Manitou, $308,748 (100). Installation of additional ballast and 112-lb. rail, Epping, N. D., to Avoca, $111,600 (100). Installation of additional ballast and 112-lb. rail, Bainville, Mont., to Blair, $383,238 (100). Installation of additional ballast and 112-lb. rail, Kremlin, Mont., to Buelow, $592,736 (0). Installation of additional ballast and 112-lb. rail, Colburn, Idaho, to Sand Point, $109,129 (100). Installation of additional ballast and 112-lb. rail, Galena, Wash., to Espanola, $100,303 (100). Enlargement of yard, Great Falls, Mont., $179,100 (100). Revision of alinement, Belton, Mont., $400,000 (100). Enlargement of engine house, Whitefish, Mont., $147,800 (10). Improvements to ore dock, Allouez, Wis., $278,650 (100), and renewal of 600 ft., ore dock No. 3, $369,000 (15).

Gulf, Mobile & Ohio

Grade Crossing Elimination: Subway: Houston, Miss. (100).

Houston Belt & Terminal

Important Work Undertaken: Rearrangement and expansion of yard including 150 ton track scale, Houston, Tex., $200,000 (100).

Illinois Central

Grade Crossing Elimination: Overcrossing: Dubuque, Ia., joint with Chicago, Milwaukee, St. Paul & Pacific, $408,000 (90).

Subway: Jackson, Miss., $187,600 (100).

Important Work Undertaken: Construct new yard, Mays Yard, Harahan Junction, La., $495,000 (100).

Illinois Terminal

Grade Crossing Elimination: Subway: Carlinville, Ill. (100).

Laurinburg & Southern

Grade Crossing Elimination: Relocation of United States Route 74, Laurinburg, N. C., $6,089 (100).

Louisville & Nashville

Second Track: Micheaud, La., to Gentilly, 7.10 miles. Flomaton, Ala., to Miles, 2.92 miles. Welka, Ala., to Flomaton, 3.08 miles.

Grade Crossing Elimination: Overcrossings: Mahlep, Ala., $100,000 (started). Montgomery, Ala., $100,000 (75). Mobile, Ala., $100,000 (75). West Point, Ky., $275,000 (100). East Bernstadt, Ky., $80,000 (100). Fariston, Ky., $80,000 (100). Williamsburg, Ky., $80,000 (started). Pennington Gap, Va., $15,320 (100). Knoxville, Tenn., $400,000 (100).

Subway: Murfreesboro Pike, Nashville, Tenn., $175,000 (75).

Important Work Undertaken: Construction of 1 pier and replacement of through truss span over Kentucky river, Ford, Ky., $151,114 (30). Improved yard and coaling facilities, Flomaton, Ala., $161,774 (80).

Maine Central

Grade Crossing Elimination: Overcrossing: St. Johnsbury, Vt., $320,000 (90).

Subway: Fairfield, Me., $276,000 (75).

Minneapolis, Northfield & Southern

Grade Crossing Elimination: Overcrossing: 6th avenue, North Golden Valley Township, Minn., $50,000 (100).

Missouri-Kansas-Texas

Grade Crossing Elimination: Overcrossings: United States Route 40, Lloyds, Mo., $106,400 (87). State Route 52, Windsor, Mo., $88,000 (100).

Subways: State Route 19, Atoka, Okla., $129,000 (75). United States

Route 69, Tullahassee, Okla., $82,000 (100). United States Route 75, Sherman, Tex., $95,800 (75).

Important Work Undertaken: Relocation of 8.8 miles of main track submerged by Denison Reservoir, Pottsboro, Tex., to Sadler, $900,000 (15).

Missouri Pacific

Grade Crossing Elimination: Overcrossing: United States Route 69, Wagoner, Okla., $75,000 (25-work suspended temporarily).

Subway: State Route 30, Gravois avenue, St. Louis, Mo., $330,000 (98).

Important Work Undertaken: Replace swing span, drawbridge over St. Francis river, Parkin, Ark., $240,000 (60). Reconstruct portion bridge over Arkansas river because of change in channel, Medina, Ark., $548,000 (80). Five additional yard tracks, Locust Street yard, North Little Rock, Ark., $168,000 (100). Revision of alinement and grade, Greenwood Junction, Okla., $251,100 (100).

(Gulf Coast Lines) Construction of high level crossing over Morganza floodway involving 6.2 miles of line revision and 18,750 ft. of reinforced concrete floodway bridge, Krotz Springs, La., to Lottie, $2,198,389 (80).

Nashville, Chattanooga & St. Louis

Grade Crossing Elimination: Overcrossings: Creosote timber viaduct, highway 76, Paris, Tenn., $65,000 (100). Concrete viaduct, Carrol st., Tullahoma, Tenn., $300,000 (5).

Subway: Murphy road (Minnesota ave.), Nashville, Tenn., $220,000 (95).

New York Central

Grade Crossing Elimination: Track elevation to eliminate 13 grade crossings, involving the construction of 7 subways and 1 pedestrian subway, Dunkirk, N. Y., $3,000,000 (100).

Overcrossings: Viaduct to carry School and Main streets over railway; Robinson st. closed and pedestrian subway construction, Bedford Hills, N. Y., $620,200 (100). Viaducts to carry Fort Hunter and Schenectady-Duanesburg Highway over railway, Schenectady road closed, South Schenectady, N. Y., $597,000 (100). Main st., Philadelphia, N. Y., $162,300 (100). State Route 9214, Post Creek, N. Y., $218,900 (75). Sweets crossing, Martisco, N. Y., $123,000 (100). Orchard Park road, State Route 67, Bay View, N. Y., $107,900 (100). Main st., Becket, Mass., $114,000 (100).

Subways: State Route 918, North Macedon, N. Y., $338,300 (100). Subway to eliminate Allegheny and Railroad streets; Railroad st. closed, Corfu, N. Y., $386,600 (100). Two subways at Miller and Goodyear avenues, East Buffalo, N. Y., $683,900 (100). State Route 640, Pattersonville, N. Y., $326,900 (10). Lake st., North East, Pa., including closing of Pearl st., $311,700 (100). West 130th st., Cleveland, Ohio, $523,425 (100).

Relocation of Highways: Seven crossings eliminated by relocation of 3.25 miles of line, Herkimer, N. Y., $3,380,000 (90). State Route 297, relocated and carried under railroad, Utica, N. Y., $211,000 (100). State Route 5600, including subway, Irving, N. Y., $155,000 (100).

Reconstruction of Existing Grade Separation Structures: Reconstruction of viaduct, 165th st., and Melrose avenue, New York City, N. Y., $508,300 (0). Reconstruction of Bridge T-7, Aqueduct, N. Y., $124,500 (100). Reconstruction of subway bridge, Bulkley Blvd., Cleveland, Ohio, $755,020 (60).

Important Work Undertaken: Track to Army Base, East Syracuse, N. Y., $250,000 (100). Extension of enginehouse stalls and construction of circular wet ash pits and 4 inspection pits, East Syracuse, N. Y., $520,000 (60). Reconstruction of 12 stalls of enginehouse and incidental track changes to replace structure damaged by fire, Gardenville, N. Y., $180,000 (80). Relocation of 1.9 miles of line and construction of reinforced concrete bridge, 25 ft. above present Mahoning river bridge to replace line to be submerged by Berlin reservoir, between Deerfield, Ohio and North Benton, $800,000 (60).

(Boston & Albany) *Grade Crossing Elimination:* Reconstruction of Existing Grade Separation Structures: Bridge 158.83, Richmond, Mass., $119,096 (98).

(Cleveland, Cincinnati, Chicago & St. Louis) *Important Work Undertaken:* Replacing 12 stalls in enginehouse with 16 stalls, 13 of which are 130 ft. long; construction of pump and fan room, office building, service building, arch brick building and addition to machine shop; installation of boiler washing system, Bellefontaine, Ohio, $354,000 (75). Six additional yard tracks, Bellefontaine, Ohio, $252,000 (40).

(Michigan Central) *Grade Crossing Elimination:* Relocation of United States Route 112 and construction of subway, Willow Run, Mich., $480,000 (60).

(Pittsburgh & Lake Erie) *First Track:* Ohio River Branch, in Pennsylvania, 1.14 miles.

New Road Under Construction: Extension of Ohio River Branch, 0.07 miles.

New York, Chicago & St. Louis

Important Work Undertaken: Extensions to passing sidings and installation of C. T. C., Hadley, Ind., to South Whitley, $102,125 (100). Replacement of wood trestle with steel viaduct, bridge 379.97, and realinement of 2780 ft. of main track, Ramsey, Ill., $142,293 (98). Replacement of steel girders with concrete arch and embankment, bridge 15.84, Lakeview, N. Y., $279,651 (100). Reconstruct tracks, Madison Street yard, Conneaut, Ohio, $120,000 (90).

New York, New Haven & Hartford

Grade Crossing Elimination: Overcrossings: Bean's crossing, Northbridge, Mass., $120,000 (100). Chase's crossing, Northbridge, Mass., $120,000 (100). Camp Edwards, North Falmouth, Mass., $100,000 (100). New overpass approach to new bridge over Thames river, New London, Conn., N. Y. N. H. & H. proportion, $200,000 (100). Overcrossing on approach to bridge over Connecticut river, Hartford, Conn., N. Y. N. H. & H. proportion, $200,000 (100). Warwarme avenue, Hartford, Conn., N. Y. N. H. & H. proportion, $300,000 (100). Viaduct over rail and river, Boulevard Tunnel, Hartford, Conn., N. Y. N. H. & H. proportion, $100,000 (100).

Reconstruction of Existing Grade Separation Structures: Abington, Conn., $100,000 (100). Hamden, Conn., $20,000 (100). Maxim road, Hartford, Conn., $100,000 (100).

Important Work Undertaken: One story garage for lease to Armour & Company including track facilities, Providence, R. I., $285,000 (100). Replacement of open deck timber trestle with ballast deck structure, Bridge 35.11, Lyme, Conn., $130,000 (100). Replacement of timber trestle with deck plate girder spans, Bridge 2.55, New Haven, Conn., $225,000 (100). Renewal of deck on steel span and trestle approach, Bridge 0.87, Boston, Mass., $120,000 (100). Passenger station and express facilities, Meriden, Conn., $100,000 (100). Additional tracks and turnouts, Oak Point yard, New York City, N. Y., $172,000 (50).

Norfolk & Portsmouth Belt Line

Important Work Undertaken: Extension of 8 tracks and replacement of 1 track, Port Norfolk yard, Norfolk, Va., (15). Construction of 8 yard tracks, Berkley yard, Norfolk, Va., $100,000 (25). Construction of 9 additional yard tracks and new engine storage track, Sewalls Point, Norfolk, Va., $93,000 (50).

Norfolk & Western

First Track: Gilbert, W. Va., 3.80 miles. Nolan, W. Va., 3.75 miles.

Third Track: At Walton, Va., 0.06 miles.

Grade Crossing Elimination: Overcrossings: Pearisburg, Va., $390,780 (100). Boyce, Va., $102,572 (100). Franklin Furnace, Ohio, $254,000 (100). Pepper, Va., $288,154 (100).

Subway: Lunbeck, Ohio, $30,000 (100).

Relocation of Highway: Cold Spring, Va., $20,000 (100).

Important Work Undertaken: Extension of yard, Roanoke, Va., $4,700,000 (100). Extension of roundhouse, construction of shop buildings, and other facilities, Roanoke, Va., $270,750 (90). Flood defense, Ironton, Ohio, $203,000 (100). Construction of spur up Bens Creek, Gilbert Branch, W. Va., 3.80 miles, $188,000 (100). Construction of spur, Nolan, W. Va., into Ky., 3.75 miles, $500,000 (100). Westbound classification yard and incidental facilities, Portsmouth, Ohio, $655,000 (100). Extension of 7 tracks in eastbound forwarding yard, Bluefield, W. Va., $200,000 (100).

Northern Pacific

Grade Crossing Elimination: Overcrossing: Regis, Mont., $173,578 (100).

Subway: Mandan, N. D., $176,356 (60).

Pennsylvania

Second Track: Smithboro, Ill., to Stubblefield, 6.67 miles.

New Road Under Construction: At Renton Junction, Pa., 0.11 miles.

Grade Crossing Elimination: Marley road, Bacon Hill, Md., closed by agreement, (100). Penrose avenue, Philadelphia, Pa., closed by reason of new connection built to Girard Point, (100). Creamery road, Rheems, Pa., closed, (100). Track elevation to eliminate grade crossings, Dunkirk, N. Y., (100).

Overcrossings: State highway, Landover, Md., (100). Overhead bridge to eliminate 2 grade crossings, State highway, Florin, Pa., (100). Heald st., Wilmington, Del., (100). State highway, Short Lane, Md., (40). Yost road, Pottstown, Pa., (65). State highway, Magnolia, Md., (15). Massillon, Ohio, (22). Port Allegany, N. Y., (100). Orchard Park road, West Seneca, N. Y., (100). United States Route 40, Mulberry Grove, Ill., (25). United States Route 40, Stubblefield, Ill., (100). Erie avenue and Brotherton road, Cincinnati, Ohio, (100). New York avenue, Washington, D. C., (100). Ninth st., Washington, D. C., (100).

Subways: Elm st., Erie, Pa., (8—work suspended temporarily). East Union, Ohio, (100). State Route 655, Poth road, East Columbus, Ohio, (40).

Relocation of Highways: Elimination of 5 crossings by relocation of highway, Dauphin, Pa., (95). Marietta road, closed by construction of Parallel road, Florin, Pa., (100). State highway relocated to eliminate grade crossing, Parkersford, Pa., (100).

(Approximate total cost of the foregoing projects, $6,796,160.)

Important Work Undertaken: Laundry facilities, Long Island City, N. Y., (100). Extension to Pier J, and install crane, Jersey City, N. J., (100). Rebuilding bulkhead, Greenville yard, Jersey City, N. J., (100). Additional track for coal storage, South Amboy, N. J., (100). Forty-one additional storage tracks, Kearny, N. J., (100). Nine additional coal storage tracks, Old Bridge, N. J., (100). Extension of coal storage yard, Old Bridge, N. J., (100). Installation of water pans on tracks 2 and 3, North Rahway, N. J., (100). Installation of water pans on tracks 2 and 3, Bristol, Pa., (100). Additional storage tracks to hold 360 cars, south of freight line, Newark, N. J., (100). Tracks to provide ground storage space for 960 cars, south of freight line, Newark, N. J., (100). New restaurant in passenger station, Newark, N. J., (100). Installation of 3 additional escalators, Pennsylvania Station, N. Y., (100). New buffet and alterations to ticket office, Pennsylvania Station, N. Y., (100). Additions to oil storage yard facilities, Linden, N. J., (100). Segregation of tunnels for flood control, Pennsylvania Station, N. Y., (100). Alterations and improvements to Commissary Building, Long Island City, N. Y., (75). Four new stores on south side of Long Island Concourse, Pennsylvania Station, N. Y., (3). Reconstruction of stock yards to replace facilities destroyed by fire, Jersey City, N. J., (80). Railroad facilities in connection with Camp Kilmer, Stelton, N. J., (100). Increased capacity for thawing shed, South Amboy, N. J., (100). Industrial switching tracks, Bleigh Street yard, Philadelphia, Pa., (100). Additional industrial switching tracks, Fairhill yard, Philadelphia, Pa., (100). New connection between Penrose Avenue yard and Girard Point yard including rearrangement of tracks at the south and north ends of Penrose Avenue yard, Philadelphia, Pa., (100). Extension of 6 tracks to hold 125 cars, including electrification of these tracks, westbound receiving yard, Harrisburg, Pa., (60). Reduction of curvature on wye track and installation of electropneumatic switches, Rockville, Pa., (100). Extension of Lake siding, Columbia, Pa., (100). Rearrangement of tracks, Thorndale, Pa., (100). Additional pull out tracks, Enola, Pa., (100). Additional yard facilities, Benning yard, Washington, D. C., (100). Additional tracks in northbound receiving yard and additional southbound classification tracks, Edge Moor yard, Edge Moor, Del., (100). Additional tracks, Stony Creek yard, Chester, Pa., (100). Industrial tracks to plant of Triumph Explosives, Inc., Elkton, Md., (100). Nine additional yard tracks and revision of certain existing tracks to increase yard capacity, 465 cars, also new car repair yard and shop, Southport yard, Elmira, N. Y., (100). Seven additional yard tracks to increase capacity by 347 cars, Sodus Point, N. Y., (100). Additional yard tracks, west yard, and electrification of No. 2 receiving track, Pavonia yard, Camden, N. J., (100). Facilities for Municipal Pier 82, Philadelphia, Pa., (100). Additional tracks, Canton yard, Baltimore, Md., (100). Additional tracks, Bay View yard, Baltimore, Md., (70). Reconstruction of Long Bridge over Potomac river, Washington, D. C., (25). Coaling facilities, turntable and yard, East Altoona, Pa., (7). Four additional tracks, Bengies, Md., to North Point (70). Electrification of additional tracks, Potomac Yard, Va., (5). Extension of northbound track, Bowie, Md., to Seabrook, (7). Extension of Plum Creek branch to connect with Unity Railways, Unity, Pa., (100). Grading to improve alinement by eliminating reverse curve, Garfield, Ohio, (100). Extension from end of New Cumberland branch at West Virginia, Pennsylvania state line to Raccoon Creek, Georgetown, Pa., (100). Reconstruction of Bridge 16.35, Lakeview, N. Y., (100). Spur track to mines of H. C. Frick Coke Company, Bute, Pa., (90). Extension of 2 sidings at Marion, Ind., to provide capacity for 150 cars each, including remote control at ends of sidings and installation of reverse signaling between Limedale, Ind., and Almeda (100). Extension of 3 classification tracks and rearrangement of connections at west end of yard A, Columbus, Ohio, (100). Extension of Riley siding to hold 200 cars, respacing of auto-

matic signals, Thorne, Ind., to Newman, and installation of remote control switches at Gem, Henry and Riley sidings, (100). Extension of sidings to hold 150 cars each with remote control at ends of sidings, Aden, Ill., to Casey (100). Extension of sidings at St. Elmo, Ill., to Hunter, Vandalia, Highland and St. Jacob, including remote control of ends of these sidings, (100).

(Approximate total cost of the foregoing projects, $22,462,687.)

(Long Island) *Grade Crossing Elimination:* Track elevation to eliminate 40 crossings involving construction of 25,400 ft. of two-track viaduct, 830 ft. of single track viaduct, and 4,100 ft. of embankment, 9 new stations and platforms and construction of 4.6 miles of new highway, Rockaway Beach, Long Island, N. Y., (98). Elimination of 21 grade crossings by 4.50 miles of two-track subway under center of Atlantic avenue, including 2 new stations, Brooklyn, N. Y., (90). Elimination of 2 crossings by abandonment of railway; elimination of third crossing by means of subway, relocation of passenger station and construction of new freight house and additional tracks, Hempstead, Long Island, N. Y., (90). Footbridge over tracks, 51st avenue, Long Island City, N. Y., (work suspended indefinitely). Track elevation to eliminate 12 crossings involving 3.50 miles of double track and 1 mile of 4 track line; 5 new stations to be built, Old Southern, Rosedale, Long Island, N. Y., (work suspended indefinitely). Track elevation, Clinton road, Mineola, Long Island, N. Y., (100).

(Approximate total cost of the foregoing projects, $41,408,700.)

Pere Marquette

Grade Crossing Elimination: Overcrossing: Express Highway, Romulus, Mich., $240,000 (100).

Pittsburgh, Chartiers & Youghiogheny

Important Work Undertaken: Construction of four additional storage tracks and new switching track at Neville Island Pa., $117,000 (100).

Reading

Grade Crossing Elimination: Overcrossing: Viaduct on relocated highway, Avon, Pa., $466,314 (100).

Richmond, Fredericksburg & Potomac

Important Work Undertaken: Extension of 9 tracks in northbound classification yard including pile and frame trestle work, Potomac yard, Alexandria, Va., $450,000 (100). Grading and track work for an emergency yard, Potomac yard, Alexandria, Va., $175,000 (80).

St. Louis-San Francisco

Grade Crossing Elimination: Overcrossings: United States Route 77, Carrollton, Tex., $250,000 (100). United States Route 60, Wyandotte, Okla,. $150,000 (60). Garden Street, Pensacola, Fla., $125,000 (100). State Route 183, Irving, Tex., $75,000 (25).

Subways: State Route 13 and United States Route 64, Bolivar, Mo., $51,900 (75). United States Route 75, Dawson, Okla., $47,000 (10).

Important Work Undertaken: Construction of approximately 19 miles of relocated line to replace lines submerged by reservoir in Denison Dam, Ravia, Okla., to Randolph, Liggett to Platter, Mead to Lakeside, $3,500,000 (60).

St. Louis Southwestern

Grade Crossing Elimination: Carrollton, Tex., joint with Rock Island, $250,000 (100).

Seaboard Air Line

Grade Crossing Elimination: Overcrossings: Lawrenceville, Ga., (100). Okeechobee, Fla., (100). Wildwood, Fla., (100). Winter Haven, Fla., (100).

Subways: Wyatts, N. C., (100). Chester, S. C., (100).

Important Work Undertaken: Revision of grade and alinement and replacement of open bridge with concrete culvert, Appalachee river, $180,000 (35). Additional yard tracks and additions to C.T.C. signals, South Richmond, Va., to Bellwood, $178,500 (100). Revision of grade and alinement and replacement of bridge over Tiger river, Delta, Ga., $205,000 (100). Construction of second track from Chesapeake & Ohio overpass to Brown street, including reconstruction of existing viaduct, Richmond, Va., $873,000 (100). Additional shop facilities, West Jacksonville, Fla., $274,000 (100).

Southern

Grade Crossing Elimination: Overcrossings: Trenton, Ga., $40,000 (100). Bynum, Ala., $30,000 (100). Munford, Ala., $24,500 (100). Collierville, Tenn., $75,000 (100). Western avenue, Knoxville, Tenn., $464,000 (100).

Subways: Garner, N. C., $85,000 (100). Kernersville, N. C., $75,000 (100). Pacolet, S. C., $65,000 (100). Courtenay, S. C., $94,700 (100). East Spartanburg, S. C., $42,800 (100).

Reconstruction of Existing Grade Separation Structures: Widen present overhead bridge, Monroe, Va., $35,730 (100). Remodel subway structure, Riceville, Tenn., $7,500 (100).

Important Work Undertaken: Replace triple-deck frame trestle, 1,374 ft. long with two 76-ft. deck girder spans and two 55-ft. ballast deck approach trestles, filling remainder of bridge, Cordova, Ala., $119,000 (80).

(Alabama Great Southern) *Grade Crossing Elimination:* Increased vertical clearance at subway, Livingston, Ala., $10,000 (100).

(New Orleans & Northeastern) *Grade Crossing Elimination:* Subway: Downman road, New Orleans, La., $278,000 (80).

Southern Pacific

First Track: Redding, Cal., to Delta, 30.09 miles.

Second Track: At Roseville, Cal., .27 miles. At Brooklyn, Ore., .06 miles.

Grade Crossing Elimination: Overcrossings: Castroville, Cal., $42,000 (100). Adeline st., Oakland, Cal., (100). Maritime st., Oakland, Cal., (100). Additional overcrossing at Figueroa st., Los Angeles, Cal., $913,000 (100). Haskell, Ore., $29,000 (2). Pedestrian overcrossing, Fort Ord, Cal., $43,000 (90).

Subways: Burbank, Cal., $250,000 (100). Benicia, Cal., (100). Benson, Ariz., $153,304 (100). Pedestrian undercrossing, Fort Ord., Cal., $43,000 (90).

Relocation of Highway: Sunol, Cal., $160,000 (100).

Reconstruction of Existing Grade Separation Structure: Lowell, Ariz., $20,000 (100).

Important Work Undertaken: Additional yard tracks, West Oakland, Cal., $291,000 (95). Additional yard tracks, Dunsmuir, Cal., $220,000 (100). Additional yard tracks, Watsonville Junction, Cal., $102,000 (100). Additional yard tracks, Roseville, Cal., $100,000 (100). Additional yard tracks, Oakridge, Ore., $95,000 (100). Additional yard tracks, Indio, Cal., $110,000 (100). Additional yard tracks, Tucson-Polvo, Ariz., $146,000 (100). Additional yard tracks, East yard, Yuma, Ariz., $103,000 (100). Relocation of 2.25 miles of main track to permit relocation of Pacific highway under construction by United States government and State of Oregon, between Eugene, Ore., and Springfield, $140,000 (60). Construction of concrete sea wall to prevent erosion by ocean along Coast Line, San Francisco, Cal., to Los Angeles, $100,000 (80). Extension of 82 passing sidings at various points on system, $1,658,000 (85). Modernization of station including rearrangement of tracks, San Luis Obispo, Cal., $100,000 (30).

Southern Pacific (Lines in Texas and Louisiana)

Second Track: At High Bridge, Tex., 0.95 miles. At Echo, Tex., 1.57 miles.

Grade Crossing Elimination: Overcrossings: Cuero, Tex., $80,000 (100). Elgin, Tex., $131,000 (100).

Subway: Flatonia, Tex., $100,000 (100).

Relocation of Highway: Elgin, Tex., $135,000 (100).

Important Work Undertaken: Thirteen additional tracks, Avondale, La., $150,000 (100). Raise grade of track and construction of new station in connection with United States government flood control project, Berwick Bay, Morgan City, La., $250,000 (100).

Spokane, Portland & Seattle

Grade Crossing Elimination: Overcrossing: Construction of overcrossing on relocated State Route 8, Vancouver, Wash., $45,000 (100).

Important Work Undertaken: Construction of 8 stall enginehouse including 110-ft. turntable, shop, equipment for driving machine tools electrically and incidental tracks, Portland, Ore., $450,000 (40). 500 car addition to yard, Wishram, Wash., $170,000 (60).

Strouds Creek & Muddlety

First Track: Delphi, W. Va., to Ticoal, 3.96 miles, $60,000.

Texas & Pacific

Grade Crossing Elimination: Relocation of existing overcrossing and construction of subway, Elmo, Tex., $174,000 (100).

Texas Pacific-Missouri Pacific Terminal of New Orleans

Important Work Undertaken: Construction of enginehouse, power plant, storehouse and offices and rearrangement of yard, New Orleans, La., $329,000 (95). Construction of yard, car repair and water facilities, Avondale, La., $426,000 (98).

Tremont & Gulf

New Road Under Construction: West Monroe, La., 9.50 miles, $200,000 (40).

Union Pacific

Grade Crossing Elimination: Overcrossings: Viaduct crossing 3 tracks of U. P. and 4 tracks of A. T. & S. F., joint with state and Santa Fe, Aliso st., Los Angeles, Cal., $3,650,000 (95). United States Route 31, Elkhorn, Neb., $145,422 (100). Access road to Sioux Ordnance Plant, Brownson, Neb., $36,000 (100). United States Route 30, Stanfield, Ore., $10,000 (100). Spokane st., Seattle, Wash., joint with G. N., N. P., C. M. St. P. & P., and P. C., $1,000,000 (45).

Subways: Ordnance, Ore., $35,000 (100). United States Route 85, Sand Creek Junction, Colo., $175,000 (100). Curry, Idaho, $75,000 (100).

Important Work Undertaken: Construction of mill building, wheel and tank shop and grease house including paving, heating and lighting facilities and track changes, Cheyenne, Wyo., $446,600 (100). Revision of alinement, 2.08 miles, to retire tunnel No. 3, Wahsatch, Utah, $327,580 (100). Additional team track facilities, Food Terminal, Kansas City, Kan., $605,900 (75). Extension of 4 stalls of engine house, 1 additional stall, 1 additional radial track, extension of engine pits in 7 stalls of engine house and installation of 75 ton electric drop table and pit, Green River, Wyo., $141,365 (100). Extension of 9 stalls in engine house, enlargement of machine shop, relocation of shop machinery, and construction of 3 track drop pit, Ogden, Utah, $108,965 (100). Additional facilities at Food Terminal, Denver, Colo., $367,500 (75). Additional yard tracks and rearrangement of additional facilities including retirement of interlockings, Salt Lake City, Utah, $343,841 (100). Revision of alinement to eliminate tunnel No. 17, main line to Boise, Idaho, $157,858 (100). Revision of alinement, 13.51 miles replacing 9.37 miles of present line and raise grade on 1.13 miles of present line, Cascade Reservoir, Boise project, Cascade, Idaho to Donnelly, $455,037 (25). Construction of 80,000 barrel fuel oil storage tank including loading and unloading facilities and trackage to serve plant, Huntington, Ore., $153,200 (25). Construction of 6 additional wells, installation of chlorinator and additional booster pumping facilities, pipe lines, tank and settling basin, Las Vegas, Nev., $188,000 (100). Constructing well, installation of air-lift pumping facilities, replacement of air compressor and condenser and relaying 31,500 ft. of water pipe, Kelso, Cal., $118,100 (65). Extension of 31 passing sidings and installation of 171 miles of centralized traffic control, Las Vegas, Nev., to Yermo, Cal., $1,331,201 (60). Construction of 64,000 barrel fuel oil storage tank including loading and unloading facilities and incidental trackage, La Grande, Ore., $146,500 (25). Replacement of boiler washing plant with electrically operated boiler washing system, Green River, Wyo., $107,510 (25).

Union

Important Work Undertaken: Maintenance of Way shop and storehouse, Duquesne, Pa., $235,000 (100).

Unity

First Track: Renton Junction, Pa., to New Texas Junction, 1.36 miles.

Valley & Siletz

Grade Crossing Elimination: Subway: Helmick Park, Ore., (100).

Virginian

First Track: Mile Post 0.38 Cub Creek Branch, W. Va., to Mile Post 7.54, 7.16 miles.

Grade Crossing Elimination: Overcrossings: Route 58, Virginia Beach Blvd., Va., $173,000 (100). Pearisburg, Va., $60,000 (100).

Important Work Undertaken: Additions and revisions to north storage

(*Continued on page 85*)

Investors' Confidence Not Restored

Bond prices are some better but equity market does not indicate confidence in carriers' future. Political threats cloud outlook despite proofs of railways' economic health

By J. G. Lyne

Assistant to Editor

RESTORATION of earnings to a level of reasonableness but no similar restoration of railroad credit—such has been the most marked characteristic of the financial aspect of railroad operations during 1942. Development with respect to earnings—both gross and net—is recorded in an article in the earlier pages of this issue. The effect of improved net earnings on the status of railroad securities, as reflected by *Railway Age's* average prices of stocks and bonds on the New York Stock Exchange, is shown graphically in the chart at the bottom of this page.

The Market Does Not Respond

There has been a material improvement during the year in the price of bonds—but still not enough to bring average carrier issues back to anything like a level reflecting normal credit. There has been no improvement in prices of equities at all.

With railroad net earnings at the highest level in recent history, the investment community, plainly, regards the present favorable situation as temporary. It is as yet evidencing little or no faith in the railroad industry in general as a favorable repository for investment funds (equities especially) for the "long pull."

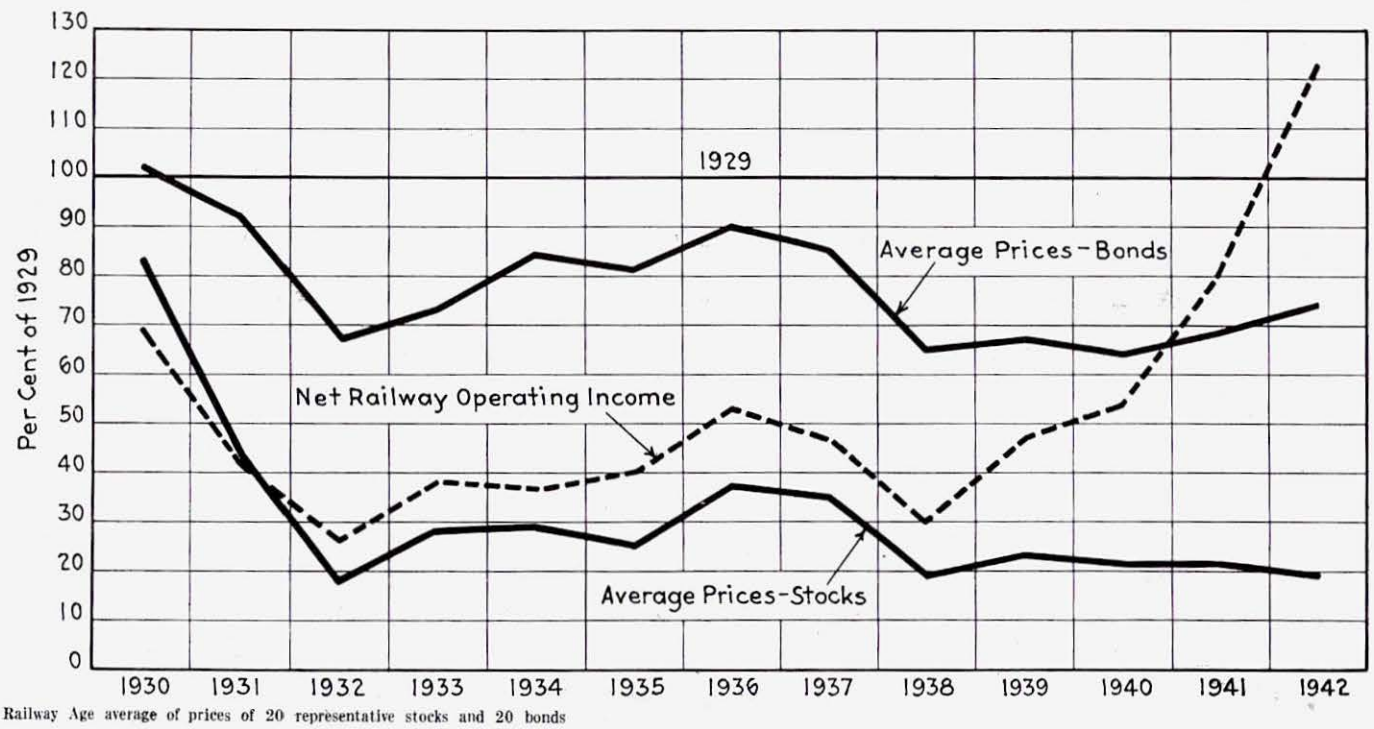
This lack of enthusiasm for corporate shares is a condition which affects the entire market, and not just the railroads. The market has suffered still another year of depression in volume, and in sluggish prices—a malady which, generally speaking, embraces the entire list, and not the railroads alone. Railroad shares, however, are still depressed far below the industrial list and their relative position did not improve during the course of the year.

Uncertainty regarding future taxes, except that they will tend to rise rather than decline, and double taxation at confiscatory rates of net corporate income when distributed as dividends, would alone be sufficient to restrain the ardor of investors. But added to this are the activities of the federal "planners," who are strenuously organizing the establishment of post-war socialism in as large a part of the economy as possible, and the failure of the political authorities to decelerate their encouragement of progressive exactions by the labor organizations.

Causes of Depressed Market Are Political

These burdens constitute just about all the discouragement which politics can lay upon private initiative and

NOTE: Statistical compilations for this article were made by *Railway Age's* librarian, Edith Stone, and by Louise Muller, editorial assistant.



Railway Age average of prices of 20 representative stocks and 20 bonds

Depressed Security Prices Showed Little Response to Improved Earnings

Railway Securities Sold by Public Offering, 1926-1942

Year	Bonds	Notes	Stock	Total R. R. financing	Total all financing	Per Cent R. R. to total
1926	$241,954,000	$172,477,000	$41,577,200	$456,008,200	$5,746,354,000	7.9
1927	686,939,500	89,184,600	210,596,900	986,721,000	7,830,641,000	12.6
1928	525,719,000	79,911,000	187,369,100	792,999,100	8,473,880,000	9.4
1929	418,984,000	180,322,000	275,269,240	874,575,240	11,007,170,000	7.9
1930	800,694,000	142,168,000	63,805,600	1,006,667,600	5,920,498,000	17.0
1931	453,824,000	105,209,000	.....	559,033,000	2,730,082,000	20.5
1932	11,827,000	13,125,000	.....	24,952,000	684,806,000	3.6
1933	12,000,000	.....	.....	12,000,000	335,812,000	3.6
1934	172,074,000	71,068,000	.....	243,142,000	618,627,000	39.3
1935	107,746,000	57,372,000	.....	165,118,000	2,190,093,550	7.6
1936	592,254,000	77,580,000	.....	669,834,000	4,061,901,025	16.5
1937	60,547,000	100,500,000	.....	161,047,000	1,589,043,484	10.1
1938	60,000,000	22,270,000	.....	82,270,000	1,635,196,000	5.0
1939	81,800,000	53,363,000	.....	135,163,000	2,099,036,000	6.4
1940	213,831,000	119,477,000	.....	333,308,000	2,770,894,000	12.0
1941	97,415,000	255,283,000	.....	352,698,000	2,406,014,000	14.7
1942*	9,500,000	31,812,000	.....	41,312,000	925,639,400	4.5

* 11 Months Total as Compiled by Dow Jones & Co.

enterprise in investment of funds, short of a final coup de grace.

There is a marked contrast, however, between the vitality of the free enterprise system as reflected in the capital market, and the accomplishment of that system in the management of industry. In the realm of efficiency of operation and volume of production, private management of industrial enterprise—especially that of the railroads—has never before so thoroughly demonstrated its effectiveness. For example, private enterprise in operating the railroads (in conjunction with intelligent co-operation by government authorities and customers) has done so much better than government managed railroads were able to do in the last war that an increase in freight performance of nearly 33 per cent was recorded in the first year of this war under private operation, as compared with an increase of only 2 per cent in the first year of government operation in the last war.

Continued "plugging away," regardless of obstacles and external discouragement, has characterized the financial management of railroad properties, no less than their physical operations. Increased earnings have been used primarily for the reduction of indebtedness. An Act of Congress was passed during the year which enables railroads to purchase their own securities at depressed prices, without being taxed on the resulting paper "profit"—a measure which should prove of considerable assistance in enabling the carriers to reduce the ratio of their indebtedness to total capitalization, provided their earnings are permitted to continue at a favorable level.

Receiverships and Trusteeships Established in 1942

Name of Road	Mileage Operated	Long Term Debt in Hands of Public	Capital Stock in Hands of Public
Alton	959	$45,350,000	None
Catonsville Short Line	*	None	None
New York & Greenwood Lake	**	1,484,800	$10,600
Tampa Northern	2	1,258,000	None
Total four companies	961	$48,092,800	$10,600

* Operated by the Philadelphia, Baltimore & Washington.
** Operated by the Erie.

Little Progress in Reorganization

Not much progress was made in completing the reorganization of bankrupt railroads during the year—only two carriers of any magnitude (the Minneapolis & St. Louis and the Norfolk Southern) having completed the process during the year; while one more Class I road, the Alton, entered bankruptcy. Improved earnings have been a deterrent to reorganization, because, in almost all instances, the Interstate Commerce Commission has insisted upon plans which "freeze out" the equity holders entirely. During the past year, many insolvent carriers have had earnings sufficiently large to cover a year's fixed charges with a substantial residue for the equity remaining. As a consequence, the owners of the equities and other junior securities which are accorded little or no participation in the plans of reor-

Railroads Taken From Receivership or Trusteeship During 1942

Name of Road	Mileage Operated
Chicago, Springfield & St. Louis	8
Georgia, Southwestern & Gulf	36
Albany & Northern	..
Louisiana Southern	15
Minneapolis & St. Louis	1,409
Nevada Copper Belt	29
Norfolk Southern	733
Wilkes-Barre & Eastern	*
Total	2,230

* Removed from trusteeship during 1941.

Principal Equipment Trust Issues Sold in 1942

Road	Maturity	Amount	Int. Rate %	Sold to Banker: Price	Sold to Banker: Cost	Purchaser
Chesapeake & Ohio	1943-1952	$5,150,000	1¾	99.222	1.90	Halsey, Stuart & Co., et al.
Chi. & Eastern Ill.	1942-1957	1,200,000	2½	Par	Par	Reconstruction Finance Corp.
Chi. & No. West	1943-1952	3,800,000	2⅜	100.31	2.3	Harris, Hall & Co.
Chi. & No. West	1943-1952	3,750,000	2½	100.284	2.444	First Boston Corp., et al.
N. Y., N. H. & H.	1943-1952	2,940,000	2½	100.164	2.47	Halsey, Stuart & Co., et al.
N. Y., N. H. & H.	1943-1952	1,390,000	2	98.559	....	Halsey, Stuart & Co.
Northern Pacific	1943-1952	1,800,000	2⅛	99.069	2.31	Salomon Bros. & Hutzler
Northern Pacific, Ser. B	1943-1952	2,500,000	2	99.1399	2.17	Shields & Co., and Bear, Stearns & Co.
Pennsylvania, Ser. M	1943-1957	18,465,000		100.18	2.4	Salomon Bros. & Hutzler, et al.
Pere Marquette	1943-1952	680,000	2	99.625	2.1	Halsey, Stuart & Co., Inc.
St. Louis-San Fran.	1943-1952	2,120,000	2	99.2599	2.15	Salomon Bros. & Hutzler, et al.
Seaboard Air Line, Ser. LL	1943-1952	2,280,000	2¾			Reconstruction Finance Corp.
Southern Pacific, Ser. S.	1943-1952	4,430,000	2½	Par		First Boston Corp., et al.
Southern Pacific, Ser. S.	1943-1952	5,660,000	2½	100.009	2.5	Salomon Bros. & Hutzler, et al.
Southern Pacific, Ser. U.	1944-1953	3,950,000	2-2½	99.091	2.5419	Harris, Hall & Co.
Wabash, Ser. A	1943-1952	2,000,000	2⅛	99.25	2.3	Halsey, Stuart & Co.
Wheeling & Lake Erie, Ser. I	1943-1952	1,050,000		99.30	1.86	Salomon Bros. & Hutzler, et al.

NOTE: A number of issues of 1941 and 1942 were modified or cancelled, by reason of WPB orders preventing the acquisition of the equipment called for in the terms of the loan.

Railroads in the Hands of Receivers or Trustees on December 31, 1942

Road	Mileage operated	Mileage owned	Date of receivership or trusteeship	Long term debt in hands of public	Capital stock in hands of public	Total securities in hands of public	Receiver's or trustee's certificates in hands of public	Principal amount of obligations in default as to principal and/or interest
Akron, Canton & Youngstown	171	19	Apr. 4, 1933	$3,588,000	$1,500,000	$5,603,452	$76,000	$3,550,000
Northern Ohio	....	152	April. 4, 1933	2,500,000	79,700	2,579,700	None	2,500,000
Alabama, Tennessee & Northern	218	215	Dec. 15, 1934	3,783,789	1,533,848	5,502,637	.....	3,783,789
Alton	959	651	Nov. 25, 1942	45,350,000	None	46,452,591	None	45,350,000
Ann Arbor	294	294	Dec. 4, 1931	7,000,000	40,800	7,040,800	None	None
Burlington, Muscatine & Northwestern	11	11	Nov. 16, 1937	None	100,000	100,000	None	None
California & Oregon Coast	15	15	Feb. 19, 1925	209,226	350,000	559,226	25,000	209,226
Catonsville Short Line	....(a)	4	Jan. 1, 1942	None	None	None	None	None
Central of Georgia	1,816	1,405	Dec. 19, 1932(b)	53,722,000	None	57,486,570	2,634,885(c)	48,882,000
Central Railroad of New Jersey	661	380	Oct. 31, 1939	48,731,000	11,942,800	60,673,800	None	48,731,000
Chicago & North Western	8,125	7,892	June 28, 1935	325,947,000	180,835,300	553,481,562	None	305,820,000
Chicago, Attica & Southern	154	139	Aug. 5, 1931	441,200	2,294,452	2,752,152	None	441,200
Chicago, Indianapolis & Louisville	520	520	Dec. 30, 1933	26,141,000	1,818,000	31,586,054	None	26,071,000
Chicago, Milwaukee, St.Paul & Pacific	10,820	9,839	June 29, 1935	448,100,017	224,396,134	675,996,151	20,723,000	262,057,559(d)
Chicago, Rock Island & Pacific	7,848	5,017	June 7, 1933	266,880,383	128,892,512	395,772,894	20,948,000	173,071,383
Chicago, Rock Island & Gulf	....	635	Oct. 31, 1933	None	None	None	None	None
Choctaw, Oklahoma & Gulf	....	785	Oct. 31, 1933	8,935,000	None	8,935,000	None	None
Peoria Terminal	32(e)	30(e)	Oct. 31, 1933	930,000	None	930,000	None	930,000
Rock Island, Arkansas & Louisiana	....	376	Aug. 31, 1933	11,453,600	None	11,453,600	None	11,453,600
Rock Island, Memphis Terminal	....	6(e)	Oct. 31, 1933	None	None	None	None	None
Rock Island, Omaha Terminal	....	3(e)	Oct. 31, 1933	None	None	None	None	None
Rock Island, Stuttgart & Southern	....	21	Oct. 31, 1933	None	None	None	None	None
St. Paul & Kansas City Short Line	....	417	Aug. 31,1933	9,984,550	None	9,984,550	None	9,984,550
Denver & Rio Grande Western	2,430	2,135	Nov 1, 1935	126,100,000	13,754,400	143,601,299	None	120,216,000
Denver & Salt Lake Western	....	38	Nov. 1, 1935	None	None	3,110,850	None	None
Duluth, South Shore & Atlantic	550	447	Jan. 1, 1937	3,822,000	10,827,500	14,649,500	171,422	3,822,000
Mineral Range	26	26	June 1, 1937	317,071	705,800	1,022,871	None	317,071
Florida East Coast	685	679	Sept. 1, 1931(f)	58,338,000	37,500,000	95,838,000	None	45,000,000
Fonda, Johnstown & Gloversville	20	20	Apr. 20, 1933	6,143,000	3,000,000	9,143,000	None	6,143,000
Fort Smith, Subiaco & Rock Island	15	15	July 23, 1938	None	None	None	None	None
Georgia & Florida	408	363	Oct. 19, 1929	7,589,708	13,382,441	22,134,789	600,000	6,089,708
Meridian & Big Bee River	50	50	June 15, 1933	500,000	300,000	800,000	969,252	500,000
Minneapolis, St. Paul & Sault Ste.Marie	3,219	3,160	Dec. 31, 1937	87,322,800	18,086,700	117,127,799	None	87,322,800
Missouri Pacific	7,143	6,212	Apr. 1, 1933	386,275,500	154,639,600	571,980,335	14,959,000	384,635,500
Boonville, St. Louis & Southern	....	0.18	June 1, 1936	245,000	None	245,000	None	245,000
Cairo & Thebes	....	25	Dec. 1, 1937	1,699,000	None	1,699,000	None	1,699,000
Chester & Mount Vernon	....	64	Dec. 1, 1937	None	None	None	None	None
Fort Smith Suburban	....	7	Dec. 1, 1937	None	None	None	None	None
Marion & Eastern	....	7	Dec. 1, 1937	None	None	None	None	None
Missouri-Illinois	172	123	July 1, 1933	1,204,500	1,102,500	2,307,000	413,000	None
Missouri Pacific R.R. Corp.in Nebr.	....	349	Apr. 1, 1933	None	None	None	None	None
Natchez & Southern	7	7	Dec. 1, 1937	None	None	None	None	None
New Orleans, Texas & Mexico	191	173	July 1, 1933	42,970,000	859,800	43,829,800	None	42,970,000
Asherton & Gulf	32	32	Dec. 1, 1937	None	None	None	None	None
Asphalt Belt	18	18	Dec. 1, 1937	None	None	None	None	None
Beaumont, Sour Lake & Western	146	84	July 1, 1933	None	None	None	None	None
Houston North Shore	....	27	July 1, 1933	None	None	None	None	None
Houston & Brazos Valley	38	38	Dec. 1, 1937	None	None	None	None	None
International-Great Northern	1,155	1,101	Apr. 1, 1933	45,750,000	None	46,165,847	None	45,750,000
Austin Dam & Suburban	....	2(g)	Dec. 1, 1937	None	None	None	None	None
New Iberia & Northern	104	65	Dec. 1, 1937	None	None	None	None	None
Iberia, St. Mary & Eastern	....	40	Dec. 1, 1937	None	None	None	None	None
Orange & Northwestern	62	62	Dec. 1, 1937	None	None	None	None	None
Rio Grande City	21	18	Dec. 1, 1937	None	None	None	None	None
St. Louis, Brownsville & Mexico	602	556	July 1, 1933	None	None	None	None	None
San Antonio Southern	45	29	Dec. 1, 1937	None	None	None	None	None
San Antonio, Uvalde & Gulf	317	314	July 1, 1933	None	None	None	None	None
San Benito & Rio Grande Valley	131	131	Dec. 1, 1937	None	None	None	None	None
Sugar Land	53	31	Dec. 1, 1937	None	None	None	None	None
New Jersey & New York	41	32	July 1, 1938	1,022,960	368,400	1,391,360	None	1,022,960
New York & Greenwood Lake	....(h)	45	Jan. 21, 1942	1,484,800	10,600	1,495,400	None	1,484,800
New York, New Haven & Hartford	1,839	1,179	Oct. 23, 1935	248,134,244	206,155,300	478,013,363	None	191,475,244
Hartford & Connecticut Western	....	22	July 31, 1936	None	338,200	338,200	None	None
Old Colony	....	453	June 2, 1936	14,348,200	12,500,800	28,249,000	None	14,348,200
Boston & Providence	....	65	Aug. 5, 1938	2,170,000	3,996,000	6,166,000	None	2,170,000
Providence, Warren & Bristol	....	14	Feb. 13, 1937	None	44,900	44,900	None	None
New York, Ontario & Western	547	296	May 20, 1937	29,853,000	58,114,043	89,925,093	144,000	29,728,000
New York, Susquehanna & Western	262	117	June 1, 1937	12,432,233	None	12,432,233	None	12,432,233
Northern Railroad of New Jersey	....(h)	21	Jan. 26, 1939	861,000	1,000,000	1,861,000	None	861,000
Pittsburg, Shawmut & Northern	190	156	Aug. 1, 1905	14,655,600	15,000,000	29,655,600	2,044,350	14,655,600
Rio Grande Southern	172	172	Dec. 16, 1929	2,728,000	930,300	3,658,300	None	2,728,000
Rutland	407	396	May 5, 1938	9,216,000	9,080,300	18,296,300	None	9,216,000
St. Louis-San Francisco	4,953	4,883	Nov. 1, 1932(i)	265,726,597	114,701,526	394,062,418	None	261,588,597
St. Louis, Southwestn & Affiliated Cos.	1,617	1,413	Dec. 12, 1935	51,991,395	4,733,500	79,991,233	None	30,564,395
Seaboard Air Line	4,232	3,311	Dec. 23, 1930	163,261,178	84,964,792	248,225,970	12,818,500	147,973,178
Georgia, Florida & Alabama	....	133	Nov. 7, 1931	1,750,000	1,500,000	3,250,000	None	1,750,000
Seaboard-All Florida	....	182	Feb. 2, 1931	12,824,738	None	12,824,738	None	12,824,738
East & West Coast	side track		Feb. 2, 1931	583,018	None	583,018	None	583,018
Florida Western & Northern	....	233	Feb. 2, 1931	13,578,744	None	13,578,744	None	13,578,744
Tampa Northern	2	49	May 7, 1942	1,258,000	None	1,258,000	None	1,258,000
South Dayton	....	1	Jan. 12, 1937	Data not available.				
Tallulah Falls	57	57	June 23, 1923	None	None	None	None	None
Virginia & Truckee	47	47	Apr. 27, 1938	None	5,000,000	5,000,000	None	None
Waco, Beaumont, Trinity & Sabine	41	41	Feb. 8, 1930	None	1,113,000	1,113,000	12,733	None
Western Pacific	1,195	1,137	Aug. 2, 1935	63,774,509	75,800,000	139,574,509	9,625,000	59,698,509
Wilmington, Brunswick & Southern	30	30	Mar. 17, 1933	93,750	165,000	258,750	None	93,750
Wisconsin Central	1,122	984	Dec. 2, 1932	34,499,000	11,391,700	45,890,700	None	33,513,000
Yosemite Valley	78	78	Dec. 22, 1936	2,318,000	1,448,775	3,963,400	None	2,318,000
Yreka Western	8	8	Sept. 16, 1935	None	None	None	14,000	None

(a) Operated by the Philadelphia, Baltimore & Washington.
(b) Changed to trusteeship June 19, 1940.
(c) Includes $1,685,885 par value of equipment purchase agreements.
(d) Does not include 5% Convertible Adjustment Mortgage Bonds in the principal amount of $182,873,693, interest on which is cumulative and matures with the principal on January 1, 2000, unless previously earned and declared payable.
(e) Yard tracks and sidings.
(f) Changed to trusteeship Feb. 1, 1941.
(g) Yard switching tracks.
(h) Operated by the Erie.
(i) Changed to trusteeship May 16, 1933.

Note:—The effort has been made, in the above table, to list only those securities of bankrupt carriers which are actually in the hands of the investing public—and to exclude securities of one carrier held by an affiliated carrier. Where securities are held by other railways not affiliated with the issuing company, however, they are included in the above list as publicly held. Owing to the complexities of some corporate structures, the decision as to the fact of public or other-carrier ownership has perforce, in some instances, been arbitrary. The purpose has been to give a general picture of the public stake in bankrupt carriers rather than a comprehensive tabulation of legal obligations.

ganization insisted upon by the I. C. C. are offering strenuous resistance to maturing of these reorganization plans.

Equity elimination is justifiable in these companies only if the depressed level of railroad traffic and earnings of the late 'Thirties is to be permanent. If national income and industrial production is going to continue, after the war, on anything comparable to the level attained during the war, equity holders in insolvent companies can make a persuasive argument for being "let in" in the reorganization plans—at least on some contingent basis. Quite likely, reorganizations are going to continue to come along slowly, either until some composition is made with the equity owners or until there is a demonstration that the traffic level of the 'Thirties is a "normal" one—a demonstration which, probably, even the most ardent advocates of the "wringer" hope will not occur.

"Voluntary" debt adjustment, without bankruptcy proceedings, has continued—the latest plan in this connection having been announced by the Delaware & Hudson toward the end of the year. Action by the D. & H. was necessary in order to meet a maturity on May 1, 1943, of $47,769,000 of 4 per cent first and refunding mortgage bonds. The plan calls for the payment of 10 per cent of the principal amount of the bonds in cash, and the extension of 90 per cent for 20 years at the present interest rate of 4 per cent. As inducement to holders to consent to the extension, additional securities are pledged under the mortgage, or are sold and the proceeds applied to the sinking fund; also two-thirds of all net income earned by the Delaware & Hudson (both the company and the subsidiary railroad corporation) will hereafter be paid into a new sinking fund, until the principal amount of the bonds outstanding is reduced to $25,000,000.

In addition, until the issue outstanding is reduced to $25,000,000, the company will pay into the sinking fund amounts equal to any dividends it may disburse, and such

Mileage in the Hands of Receivers or Trustees

(Figures to 1941, Inclusive, from I. C. C. Statistics for Year Ended December 31, 1941. Figures for 1942 Compiled by *Railway Age*.)

Year ended	Miles of road operated by receivers or trustees at close of year	Net change during year in miles of road operated	No. of roads in charge of receivers or trustees at close of year
June 30, 1894	40,819	.....	192
1895	37,856	−2,963	169
1896	30,475	−7,380	151
1897	18,862	−11,614	128
1898	12,745	−6,117	94
1899	9,853	−2,892	71
1900	4,178	−5,675	52
1901	2,497	−1,681	45
1902	1,475	−1,022	27
1903	1,185	−290	27
1904	1,323	+138	28
1905	796	−527	26
1906	3,971	+3,176	34
1907	3,926	−45	29
1908	9,529	+5,603	52
1909	10,530	+1,001	44
1910	5,257	−5,273	39
1911	4,593	−664	39
1912	9,786	+5,193	44
1913	16,286	+6,500	49
1914	18,608	+2,322	68
1915	30,223	+11,615	85
1916	37,353	+7,130	94
Dec. 31, 1916	34,804	−2,550*	80
1917	17,376	−17,428	82
1918	19,208	+1,832	74
1919	16,590	−2,618	65
1920	16,290	−300	61
1921	13,512	−2,778	68
1922	15,259	+1,747	64
1923	12,623	−2,636	64
1924	8,105	−4,518	61
1925	18,687	+10,582	53
1926	17,632	−1,055	45
1927	16,752	−880	40
1928	5,256	−11,496	33
1929	5,703	+447	29
1930	9,486	+3,783	30
1931	12,970	+3,484	45
1932	22,545	+9,575	55
1933	41,698	+19,153	78
1934	42,168	+470	80
1935	68,345	+26,177	87
1936	69,712	+1,367	91
1937	70,884	+1,172	109
1938	76,938	+6,054	109
1939	77,013	+75	108
1940	75,270	−1,743	103
1941	69,859	−5,411	91
1942	66,092	−3,767	89

* Represents decrease for six months.

Summary of Railroad Receiverships and Trusteeships, 1876 to 1942

	Roads Placed in Receivership or Trusteeship			Roads Taken from Receivership or Trusteeship*		
Year	Number of roads	Miles	Bonds and stocks	Number of roads	Miles	Bonds and stocks
1876	42	6,662	$467,000,000	30	3,840	$217,848,000
1877	38	3,637	220,294,000	54	3,875	198,984,000
1878	27	2,320	92,385,000	48	3,906	311,631,000
1879	12	1,102	39,367,000	65	4,909	243,288,000
1880	13	885	140,265,000	31	3,775	263,882,000
1881	5	110	3,742,000	29	2,617	137,923,000
1882	12	912	39,074,000	16	867	65,426,000
1883	11	1,990	108,470,000	18	1,354	47,100,000
1884	37	11,038	714,755,000	15	710	23,504,000
1885	44	8,836	385,460,000	22	3,156	278,394,000
1886	13	1,799	70,346,000	45	7,687	374,109,000
1887	9	1,046	90,318,000	31	5,478	328,181,000
1888	22	3,270	186,814,000	19	1,596	64,555,000
1889	22	3,803	99,664,000	25	2,930	137,815,000
1890	26	2,963	105,007,000	29	3,825	182,495,000
1891	26	2,159	84,479,000	21	3,223	169,069,000
1892	36	10,508	357,692,000	28	1,922	95,898,000
1893	74	29,340	1,781,046,000	25	1,613	79,924,000
1894	38	7,025	395,791,000	42	5,643	318,999,000
1895	31	4,089	369,075,000	52	12,831	761,791,000
1896	34	5,441	275,597,000	58	13,730	1,150,377,000
1897	18	1,537	92,909,000	42	6,675	517,680,000
1898	18	2,069	138,701,000	47	6,054	252,910,000
1899	10	1,019	52,285,000	32	4,294	267,534,000
1900	16	1,165	78,234,000	24	3,477	190,374,000
1901	4	73	1,627,000	17	1,139	85,808,000
1902	5	278	5,835,000	20	693	39,788,000
1903	9	229	18,823,000	13	555	15,885,000
1904	8	744	36,069,000	13	524	28,266,000
1905	10	3,593	176,321,000	6	679	20,307,000
1906	6	204	55,042,000	8	262	10,400,000
1907	7	317	13,585,000	6	114	13,777,000
1908	24	8,009	596,359,000	3	138	2,547,000
1909	5	859	78,095,000	12	2,629	250,033,000
1910	7	735	51,427,500	17	1,100	93,660,109
1911	5	2,606	$210,606,882	13	1,386	$40,741,543
1912	13	3,784	182,112,497	12	661	25,910,990
1913	17	9,020	477,780,820	6	1,159	86,163,850
1914	22	4,222	199,571,446	9	1,470	83,189,500
1915	12	20,143	1,070,808,628	11	3,914	285,258,782
1916	9	4,439	208,159,689	26	8,355	703,444,855
1917	19	2,486	61,169,962	20	10,963	557,846,348
1918	8	3,519	242,090,800	11	763	24,735,187
1919	7	244	11,886,779	8	459	15,479,587
1920	10	541	21,620,150	7	380	7,676,200
1921	14	1,744	63,872,113	11	4,173	306,123,942
1922	12	4,330	329,114,860	15	6,151	299,491,646
1923	10	2,218	87,913,581	8	637	14,622,900
1924	11	920	30,223,372	14	3,992	269,251,082
1925	6	11,368	680,422,080	6	638	9,965,000
1926	6	88	2,821,400	12	12,852	626,662,708
1927	6	924	45,236,674	5	142	4,254,000
1928	1	19	529,000	4	209	6,393,250
1929	3	634	30,981,391	5	562	20,715,065
1930	4	4,752	277,323,994	2	1,048	124,668,500
1931	19	5,195	432,151,526	2	102	993,860
1932	13	11,817	626,577,314	8	394	8,575,178
1933	18	21,222	1,229,678,183	2	298	16,133,000
1934	1	81	460,000	2	40	1,598,600
1935	16	29,018	2,182,979,167	5	436	9,146,800
1936	4	8	43,026,400	3	122	7,507,961
1937	23	1,937	186,136,861	2	179	5,455,810
1938	9	6,194	660,997,669	8	290	.....
1939	3	733	78,858,800†	4	401	.....
1940	..	....	.....	6	3,675	.....
1941	1	25	.....	9	5,031	.....
1942	4	961	48,103,400†	7	2,230	.....

* Prior to 1938 these figures covered foreclosure sales only.
† Represents long term debt and stock.

dividends may not exceed one-sixth of net income. Acceptance of the plan by a substantial proportion of large holders is understood to have been secured, informally.

Status of R. F. C. Loans

The railroads' account with the Reconstruction Finance Corporation at the beginning of December, 1942, stood at: Disbursements, $836,343,175; Repaid, $385,676,248. A year ago the account was: Disbursements, $811,325,175; Repaid, $367,881,186.

Because of the state of the market, there was virtually no new financing, except equipment obligations—and even these were depressed in volume as compared to 1941, because of restrictions on the acquisition of equipment by the War Production Board. There were, however, sales of $9,500,000 of 3¼ per cent first mortgage bonds by the Alabama Great Southern, and of $5,955,850 of first consolidated 4 per cent bonds, series C, by the Erie. The A. G. S. issue was sold at 98.577, and the Erie issue was sold privately to an insurance company at 100.5. Major sales of equipment obligations are recorded in an accompanying table.

Dividend Increases

Very little, relatively, of the increased earnings of the railroads went into the restoration or increase of dividends—although the improvement in this respect was notable, nevertheless. In increasing the disbursement to its shareholders in December, the Pennsylvania made it clear that its improved resources were being expended, primarily, for improvements to its plant and equipment for sustained efficient service to wartime transportation. Expenditures for this purpose since September, 1939, by this company alone were set forth at the large total of $197,033,722. It is noteworthy in this connection that such war-connected expenditures are made by railroads from their own resources, whereas, in most industries producing war materials, plant expansion for this purpose has been financed by the government. Among the principal dividend changes during the year were the following:

Atchison, Topeka & Santa Fe—declared $1.50 on its common stock in November. On December 1 a disbursement of $2.50 was made on these shares, as compared to $1.50 paid in September and $1 for each quarter from September, 1941, to June, 1942.

Atlantic Coast Line—declared $2 on its common stock in November, as compared to $1 a year ago.

Chicago, Burlington & Quincy—declared $3 on its common in December; $2 a year ago.

Louisville & Nashville—total common dividends during the year were $8; in 1941 they were $7.

Texas & Pacific—$1 declared on common in December, after a lapse of 11 years, $2.50 having been paid in June on non-cumulative preferred.

New York Central—$1 declared on common, the first in 11 years.

Pennsylvania—paid $2.50 on its $50 stock during the year; compared to $2 paid in 1941.

Erie—made two payments of 50 cents each on its new common.

Nashville, Chattanooga & St. Louis—paid $3 on its common in 1942, compared to $2 in 1941.

Chicago Great Western—declared an initial 62½ cents on its cumulative 5 per cent preferred.

Southern—resumed $1.25 quarterly dividend on its non-cumulative 5 per cent preferred.

Southern Pacific—paid $1 on common in October, the first disbursement in 10 years.

Northern Pacific—declared $1 on its capital stock in December, the first disbursement in 11 years.

Railway Construction

(Continued from page 80)

yard, Sewalls Point, Va., $216,000 (100). Additions and improvements to terminal yards, Mullens and Elmore, W. Va., $400,000 (100).

Western Maryland

Grade Crossing Elimination: Subway: Elkins, W. Va., (100).
Important Work Undertaken: Renew 3 bridges, Patapsco, Md., $119,500 (100).

Western Pacific

Grade Crossing Elimination: Overcrossing: Foot of Adeline st., Oakland, Cal., $250,000 (100).
Important Work Undertaken: Additional yard tracks, Stockton, Cal., $155,000 (100). Additional yard tracks, Oroville, Cal., $136,000 (100).

Railway Construction in Canada

Canadian National

Important Work Undertaken: Purchase and rebuild Cragg building, Halifax, N. S., (100). New storage sidings, Lake Edward, Que., (100). Additional terminal facilities, Chauvigny, Que., (100). Additional yard facilities, Montreal East, Que., (to be completed in 1943). Terminal facilities, Barry's Bay, Ont., (100). New storage yard, Pt. St. Charles, Que., (100). New terminal facilities, Montreal, Que., (indefinite). Extension of yard, Turcot, Que., (100). New telegraph building, corner Portage avenue and Main street, Winnipeg, Man., (100).

Canadian Pacific

Important Work Undertaken: Installation of 28 miles of rock ballast, Sherbrooks subdivision, Que., $170,000 (100). Alterations and additions to Windsor station, Montreal, Que., $106,000 (100).

Morrissey, Fernie & Michel

Important Work Undertaken: New line 4,000 ft. long to reach colliery, including loading yard, Fernie, B. C.

Newfoundland

Important Work Undertaken: Renewal and extension of wharf and dock shops, St. Johns, N. F., $225,000 (100). Replacement of various main line bridges, $240,000 (100).

Toronto, Hamilton & Buffalo

Important Work Undertaken: New freight yard, connecting track on belt line branch, replacing burned car shop, extension to air-brake tool room and tin shop, Hamilton, Ont., $175,092 (100).

Railway Construction in Mexico

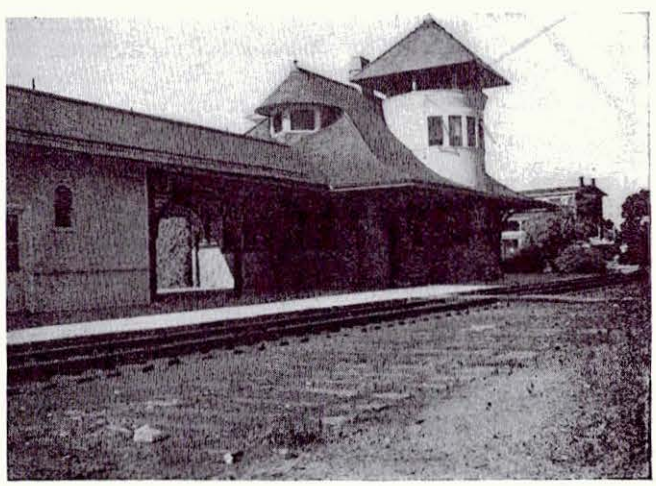
Ferrocarril Kansas City, Mexico Y Oriente, S. A.

New Line Under Survey: New line projected, Creel, Chihuahua and San Pedro, Sinaloa, along Septentrion river, 159 miles, $16,000,000 (location completed, construction not started).

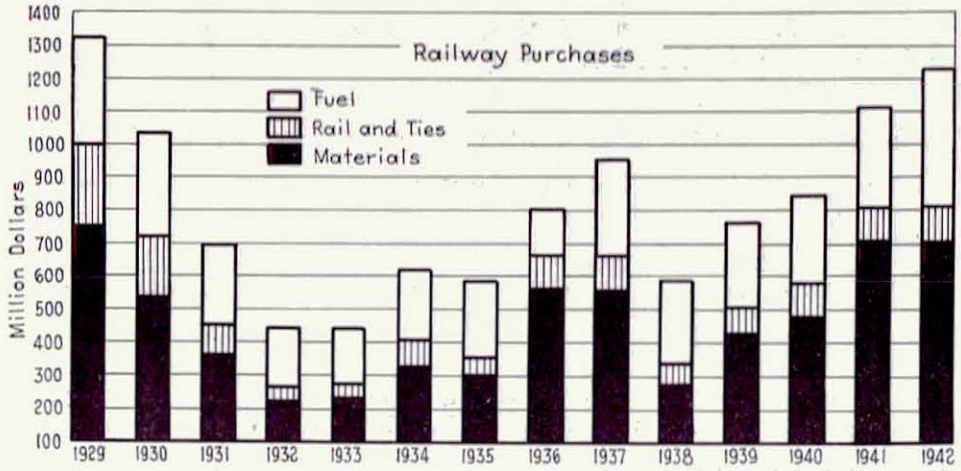
National Railways of Mexico

Grade Crossing Elimination: Subways: Kilo IB-70, $83,500 (100). Kilo N-39, $83,000 (100).
Important Work Undertaken: Construction of new freight yard at Monterrey, Nuevo Laredo, $100,000 (10).

* * *



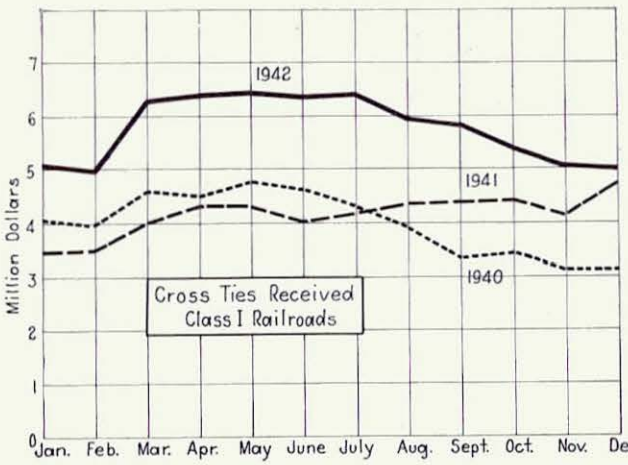
The Lehigh & Hudson River Station at Warwick, N. Y. Is Towered and Turreted



Annual Railway Purchases, Exclusive of New Equipment, 1929 to 1942

to have received about $40,000,000 of materials and fuel.

Deliveries of materials, exclusive of fuel and new equipment, in 1942 reflected an increase of approximately $238,992,000, or 41 per cent, over the corresponding receipts in 1940, and exceeded the corresponding deliveries in any year since 1929, but totaled only about



Trend of Cross Tie Purchases by Railroads, January, 1940, to November, 1942

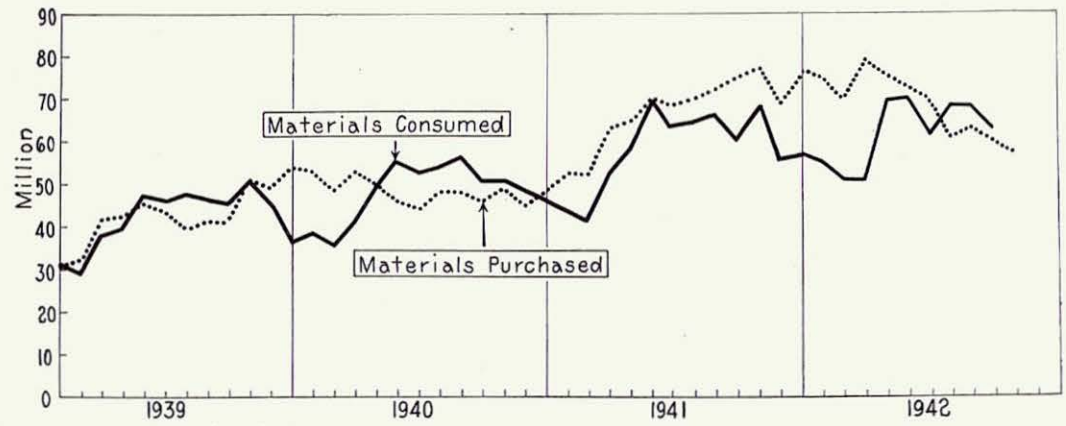
$8,107,000 more than in 1941. This increase would be more than offset by adjustments to exclude the effect of slightly higher prices paid for materials last year. Expenditures for fuel, including coal bought for storage, exceeded those in 1941 by $55,675,000, or 16 per cent, according to present information, and exceeded fuel purchases in 1940 by approximately $131,846,000, or 48 per cent; they were larger than the aggregate purchases of fuel in 1929.

The railroads are understood to have received all of

Materials in Stock—Class I Railroads

	Fuel (000)	Rail—New and S. H. (000)	Cross ties (000)	Stores Stock (000)	Scrap (000)	Total (000)
			Year 1940			
Jan. 1.....	$21,778	$25,552	$51,359	$216,996	$11,551	$327,236
Feb. 1.....	22,454	28,213	58,187	222,127	11,862	342,843
Mar. 1.....	23,190	31,546	60,615	230,045	11,576	356,972
Apr. 1.....	21,016	34,388	64,466	234,899	11,509	366,278
May 1.....	21,343	35,826	63,945	234,866	11,551	367,531
June 1.....	22,419	34,818	60,070	231,308	11,275	359,890
July 1.....	22,310	35,138	57,452	225,066	11,371	351,337
Aug. 1.....	24,065	34,134	55,988	222,001	11,326	347,514
Sept. 1.....	25,513	31,927	54,531	217,948	11,041	340,960
Oct. 1.....	25,442	30,055	53,517	216,201	10,848	336,063
Nov. 1.....	22,272	27,457	50,374	221,444	9,711	331,258
Dec. 1.....	24,414	27,674	54,464	213,555	9,602	329,709
			Year 1941			
Jan. 1.....	24,002	25,985	50,967	223,673	9,818	334,445
Feb. 1.....	24,591	26,600	60,311	220,887	10,728	343,117
Mar. 1.....	27,105	28,217	62,455	228,012	10,859	356,648
Apr. 1.....	30,984	28,573	65,356	235,404	11,102	371,419
May 1.....	23,486	25,649	58,349	251,691	9,632	368,807
June 1.....	24,578	26,461	57,051	252,972	10,357	371,419
July 1.....	25,991	24,389	51,551	266,019	9,669	377,619
Aug. 1.....	29,299	25,156	55,976	265,886	10,264	386,581
Sept. 1.....	32,632	24,500	51,745	276,661	10,380	395,918
Oct. 1.....	34,035	25,755	44,327	298,149	9,704	411,970
Nov. 1.....	37,455	24,009	44,452	309,295	9,377	424,588
Dec. 1.....	37,668	23,979	46,632	320,572	8,181	437,032
			Year 1942*			
Jan. 1.....	40,040	23,986	48,426	338,839	8,808	460,099
Feb. 1.....	40,427	22,705	60,944	346,458	10,941	481,475
Mar. 1.....	40,198	23,886	64,290	360,946	10,489	499,809
Apr. 1.....	41,372	23,635	66,837	377,799	9,947	519,590
May 1.....	43,821	22,924	65,552	386,375	10,168	528,840
June 1.....	44,574	23,562	62,424	392,441	10,689	533,690
July 1.....	48,408	22,941	58,835	393,419	10,816	534,419
Aug. 1.....	50,580	21,847	58,520	394,600	9,366	534,913
Sept. 1.....	50,434	21,622	55,800	392,513	9,609	529,978
Oct. 1.....	51,624	20,484	54,562	386,346	9,544	522,560
Nov. 1.....	51,880	17,929	45,807	389,259	10,865	515,740

* Subject to revision.



Comparative Trends in Materials Delivered and Consumed, 1939 to 1942

dividends may not exceed one-sixth of net income. Acceptance of the plan by a substantial proportion of large holders is understood to have been secured, informally.

Status of R. F. C. Loans

The railroads' account with the Reconstruction Finance Corporation at the beginning of December, 1942, stood at: Disbursements, $836,343,175; Repaid, $385,676,248. A year ago the account was: Disbursements, $811,325,175; Repaid, $367,881,186.

Because of the state of the market, there was virtually no new financing, except equipment obligations—and even these were depressed in volume as compared to 1941, because of restrictions on the acquisition of equipment by the War Production Board. There were, however, sales of $9,500,000 of 3¼ per cent first mortgage bonds by the Alabama Great Southern, and of $5,955,850 of first consolidated 4 per cent bonds, series C, by the Erie. The A. G. S. issue was sold at 98.577, and the Erie issue was sold privately to an insurance company at 100.5. Major sales of equipment obligations are recorded in an accompanying table.

Dividend Increases

Very little, relatively, of the increased earnings of the railroads went into the restoration or increase of dividends—although the improvement in this respect was notable, nevertheless. In increasing the disbursement to its shareholders in December, the Pennsylvania made it clear that its improved resources were being expended, primarily, for improvements to its plant and equipment for sustained efficient service to wartime transportation. Expenditures for this purpose since September, 1939, by this company alone were set forth at the large total of $197,033,722. It is noteworthy in this connection that such war-connected expenditures are made by railroads from their own resources, whereas, in most industries producing war materials, plant expansion for this purpose has been financed by the government. Among the principal dividend changes during the year were the following:

Atchison, Topeka & Santa Fe—declared $1.50 on its common stock in November. On December 1 a disbursement of $2.50 was made on these shares, as compared to $1.50 paid in September and $1 for each quarter from September, 1941, to June, 1942.

Atlantic Coast Line—declared $2 on its common stock in November, as compared to $1 a year ago.

Chicago, Burlington & Quincy—declared $3 on its common in December; $2 a year ago.

Louisville & Nashville—total common dividends during the year were $8; in 1941 they were $7.

Texas & Pacific—$1 declared on common in December, after a lapse of 11 years, $2.50 having been paid in June on non-cumulative preferred.

New York Central—$1 declared on common, the first in 11 years.

Pennsylvania—paid $2.50 on its $50 stock during the year; compared to $2 paid in 1941.

Erie—made two payments of 50 cents each on its new common.

Nashville, Chattanooga & St. Louis—paid $3 on its common in 1942, compared to $2 in 1941.

Chicago Great Western—declared an initial 62½ cents on its cumulative 5 per cent preferred.

Southern—resumed $1.25 quarterly dividend on its non-cumulative 5 per cent preferred.

Southern Pacific—paid $1 on common in October, the first disbursement in 10 years.

Northern Pacific—declared $1 on its capital stock in December, the first disbursement in 11 years.

Railway Construction

(Continued from page 80)

yard, Sewalls Point, Va., $216,000 (100). Additions and improvements to terminal yards, Mullens and Elmore, W. Va., $400,000 (100).

Western Maryland

Grade Crossing Elimination: Subway: Elkins, W. Va., (100).
Important Work Undertaken: Renew 3 bridges, Patapsco, Md., $119,500 (100).

Western Pacific

Grade Crossing Elimination: Overcrossing: Foot of Adeline st., Oakland, Cal., $250,000 (100).
Important Work Undertaken: Additional yard tracks, Stockton, Cal., $155,000 (100). Additional yard tracks, Oroville, Cal., $130,000 (100).

Railway Construction in Canada

Canadian National

Important Work Undertaken: Purchase and rebuild Cragg building, Halifax, N. S., (100). New storage sidings, Lake Edward, Que., (100). Additional terminal facilities, Chauvigny, Que., (100). Additional yard facilities, Montreal East, Que., (to be completed in 1943). Terminal facilities, Barry's Bay, Ont., (100). New storage yard, Pt. St. Charles, Que., (100). New terminal facilities, Montreal, Que., (indefinite). Extension of yard, Turcot, Que., (100). New telegraph building, corner Portage avenue and Main street, Winnipeg, Man., (100).

Canadian Pacific

Important Work Undertaken: Installation of 28 miles of rock ballast, Sherbrooks subdivision, Que., $170,000 (100). Alterations and additions to Windsor station, Montreal, Que., $106,000 (100).

Morrissey, Fernie & Michel

Important Work Undertaken: New line 4,000 ft. long to reach colliery, including loading yard, Fernie, B. C.

Newfoundland

Important Work Undertaken: Renewal and extension of wharf and dock shops, St. Johns, N. F., $225,000 (100). Replacement of various main line bridges, $240,000 (100).

Toronto, Hamilton & Buffalo

Important Work Undertaken: New freight yard, connecting track on belt line branch, replacing burned car shop, extension to air-brake tool room and tin shop, Hamilton, Ont., $175,092 (100).

Railway Construction in Mexico

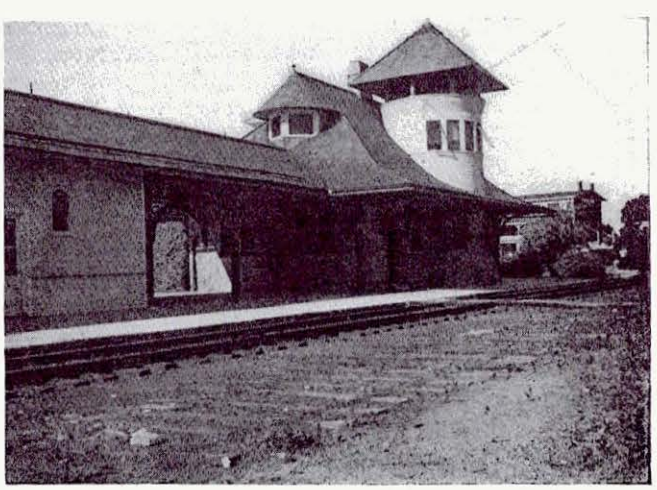
Ferrocarril Kansas City, Mexico Y Oriente, S. A.

New Line Under Survey: New line projected, Creel, Chihuahua and San Pedro, Sinaloa, along Septentrion river, 159 miles, $16,000,000 (location completed, construction not started).

National Railways of Mexico

Grade Crossing Elimination: Subways: Kilo IB-70, $83,500 (100). Kilo N-39, $83,000 (100).
Important Work Undertaken: Construction of new freight yard at Monterrey, Nuevo Laredo, $100,000 (10).

* * *



The Lehigh & Hudson River Station at Warwick, N. Y. Is Towered and Turreted

Higher Average Material Costs

Ties and Timber Cost Railroads more in 1942

Pay more for fuel ties and lumber—Government establishes price ceilings on all commodities

By D. A. Steel
Purchases and Stores Editor

COMPARED to the turmoil and confusion experienced by the railroads in getting materials and equipment last year, the problem with the prices paid for the materials and equipment they succeeded in getting was primarily one of rules and regulations—keeping up with them and occasionally applying for revisions in them, as in the case of cross ties and railroad coal.

All prices, with the principal exception of food prices (which are not considered in this review), were brought under maximum price regulations and were maintained either at the ceilings established in 1941, or at the highest prices paid prior to March, 1942, except where adjustments were made for increased freight rates, increased labor costs or taxes. Basic prices of many materials, notably iron and steel and scrap, were the same last year as in 1941; but freight rates, substitutions, changes in specifications, shifts in sources of supply and differences in quantities purchased were factors in last year's buying, with the result that railway material costs, while showing no variation from month to month, averaged slightly higher than in 1941, with fuel and forest products substantially higher.

Higher Fuel Costs

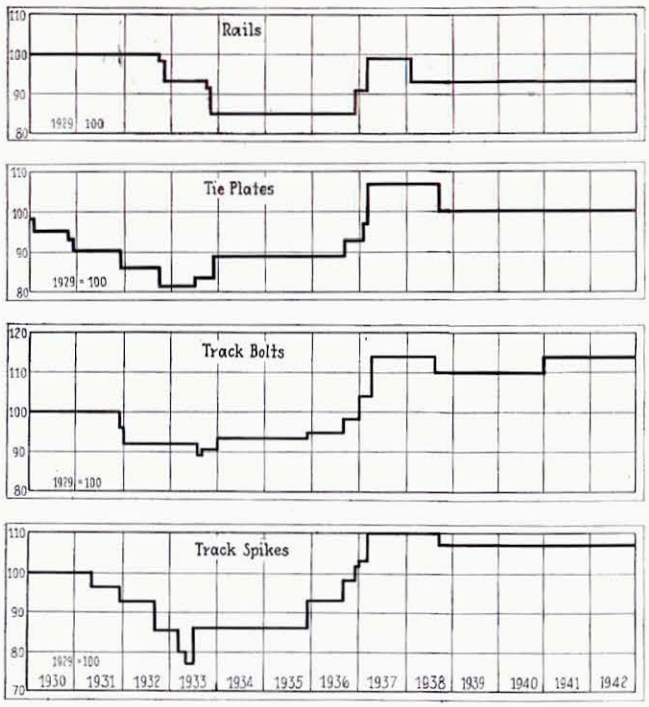
Bituminous coal, averaging $2.11 a ton at the mine to all Class I railroads, as reported to the Interstate Commerce Commission, was 9 cents a ton, or 4.5 per cent, higher than in 1941; about 11 cents, or 6 per cent, higher than the all-year average in 1939; and was higher than in any year since 1928, when it averaged $2.12 a ton. During the past year, however, many railroads paid over 25 per cent more for their coal.

Fuel oil, averaging 2.30 cents a gal. to all Class I roads, according to ICC figures, reflected an average increase of 0.16 cents a gal., or 7.5 per cent, over the all-year average in 1941; about 0.29 cents, or 14.4 per cent, over the average in 1939; and was 0.20 cents a gal. higher than in 1929, although slightly under 1939. It was 1.20 cents, or about 50 per cent, higher to roads in the Eastern district, including the New England states, last year than in 1939. Gasoline, at 10.12 cents a gal., averaged 1.13 cents higher than in 1941, and about 2.05 cents a gal., or 20 per cent, above the all-year level in 1939. Diesel fuel, at 4.92 cents a gal. to all consuming roads, according to ICC figures, was about 10 per cent higher last year than in the preceding years, 1941 and 1939.

Iron and Steel Prices

There was no change last year in the prices at which many railroads purchased iron and steel and sold iron and steel scrap. Based on the prices reported to this paper by co-operating railroads in various parts of the country, however, iron and steel cost the railroads about 4 per cent more last year than in 1941; 9 per cent more than in 1939; and about 15 per cent more in 1929. Rails, at $40 a net ton, without extras, have been unchanged since 1937; while railroads realized about 2 per cent more on scrap than in 1941, 30 per cent more than in 1939 and 41 per cent more than in 1929.

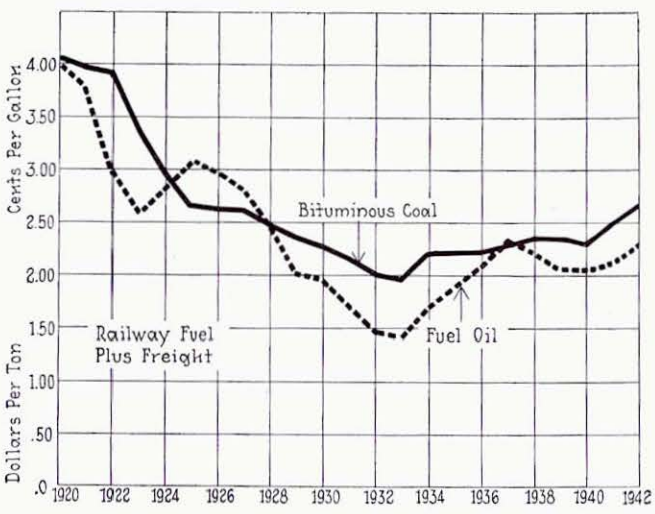
Current lumber prices, even with the regulations, de-



Comparative Trends in Track Material Costs

pend on what is bought and where and when it is bought. On some roads prices unchanged from 1941; some roads paid 15 per cent more; and others paid from $10 to $25 a 1,000 ft. bd. m. more. Prices generally averaged 25 per cent higher than the all-year average in 1941, and 65 per cent higher than in 1939; while the ceiling on the government's present schedule on Douglas fir, which is based on prices in the first quarter of last year, averages 100 per cent above the averages in the 1937 to 1940 period.

Railroads obtained an upward adjustment in cross tie prices last year and then didn't get all the ties they wanted, but paid from 10 cents to 15 cents more for untreated ties than in 1941, which was about 50 per cent more than ties averaged in 1929. Current tie prices were generally under ceilings at approximately 20 per cent over the prices paid last year before regulations, announced December 21, established specific dollars-and-cents prices on cross ties produced in Eastern states at approximately 10 per cent above the levels in March.


Cents Per Gallon
Dollars Per Ton
Bituminous Coal
Railway Fuel Plus Freight
Fuel Oil
1920 1922 1924 1926 1928 1930 1932 1934 1936 1938 1940 1942

Average Cost of Coal and Fuel Oil Consumed by Railroads

Other materials, including copper, rope, glass, paint, air brake material and hardware, in the aggregate cost the railroads about 6 per cent more than in 1941, 9 per cent more than in 1939 and about 7 per cent less than in 1929. This indicates an all-year average aggregate cost of materials to railroads about 7 per cent higher than in 1941, and about 12 per cent higher than in 1939. This is contrasted with an average increase of 140 per cent in railway costs in War I.

Wholesale prices in December, as compiled and released by the Bureau of Labor Statistics of the Department of Commerce, while reflecting practically no changes for several weeks except for continuing advances in foods, reflected an increase of 2.4 per cent in building materials in 12 months; 11.0 per cent in chemicals; 15.2 per cent in raw materials, including fuel; 3.1 per cent in some semi-manufactured materials; 6.2 per cent in manufactured products; and 5.6 per cent in all commodities other than farm products and foods, which increased 21.8 per cent and 16.5 per cent, respectively.

Characteristics of the times, when railway supply industries can no longer operate on a "business as usual" basis and are largely engaged in war production and their salesmen largely employed as expeditors or in salvage

Average Costs of Fuel Oil—Class I Railroads

Cents Per Gallon

	Fuel Oil					
	United States	Eastern District	Southern District	Western District	Gasoline	Diesel Fuel
1920	3.97	9.17	3.49	3.97	....	....
1921	3.77	5.91	4.22	3.75	....	....
1922	2.98	4.75	3.40	2.96	....	....
1923	2.58	7.77	3.05	2.48	....	....
1924	2.80	4.52	3.61	2.75	....	....
1925	3.18	4.67	3.89	3.11	....	....
1926	2.95	4.87	3.92	2.87	....	....
1927	2.80	4.66	3.68	2.73	11.78	....
1928	2.46	3.53	2.69	2.43	11.26	....
1929	2.10	3.24	2.28	2.07	11.08	....
1930	1.99	3.23	2.27	1.95	9.84	....
1931	1.71	2.54	1.87	1.69	6.98	....
1932	1.49	2.17	1.49	1.47	7.12	....
1933	1.37	2.50	1.90	1.30	7.10	....
1934	1.73	3.40	2.90	1.70	7.60	....
1935	1.90	3.10	2.50	1.90	7.80	....
1936	2.10	3.55	2.61	2.04	8.33	3.84
1937	2.35	3.70	2.97	2.30	8.81	4.39
1938	2.21	2.93	2.67	2.18	8.03	4.45
1939	2.01	2.93	2.39	1.98	7.97	4.40
1940	2.02	3.20	2.87	1.97	8.10	4.48
1941	2.14	3.71	3.44	2.06	9.25	4.45
1942*	2.30	4.40	3.66	2.04	10.12	4.92

* 9 Mos. I. C. C.

work, the competition which plagued the railway buyers a few years ago is now noticeable by its absence. Deliveries are bad with anything but top priorities or directives with scarce materials, and in addition, materials are increasingly off standard as a result of lowering specifications to save critical materials and to utilize the only materials which are available. The railroads are taking carbon steel in place of alloys; rubber is not "the same as she used to be;" and no one is turning his back on green lumber.

Sweeping Price Controls

Prices were placed under more extensive and certain controls last year by the law passed by Congress in January which authorized OPA (Office of Price Administration) to establish maximum prices, empowered it to meet emergencies by freezing prices up to 60 days pending investigations, permitted it to buy and sell commodities, pay subsidies, license dealers and to provide penalties for offenders. Previously, OPA's authority over prices and its ability to enforce compliance by polite methods were in doubt, and most price con-

trols were confined to basic materials and voluntary agreements. The law excepted agricultural products, primary raw materials and certain military purchases from its controls, but otherwise gave OPA a clear field to carry out its plan to establish maximum prices, as far as possible, at the levels prevailing between October 1 and October 15, 1941.

On February 13, OPA announced that all price schedules issued since April 11 of the previous year were to remain in effect. These prices were contained in 105 price schedules and, with few exceptions, the prices which had already been approved by OPA in 1942 were those which had prevailed on October 1, 1941. This action to formalize the steps which had previously been taken in price regulation, was followed on April 28 with a General Maximum Price Regulation, forbidding retailers, after May 18, and manufacturers and wholesalers, after May 11, to charge higher prices than in March and continuing in force existing price schedules and regulations, most of which held prices at the levels in October, 1941, or at least prior to March, 1942.

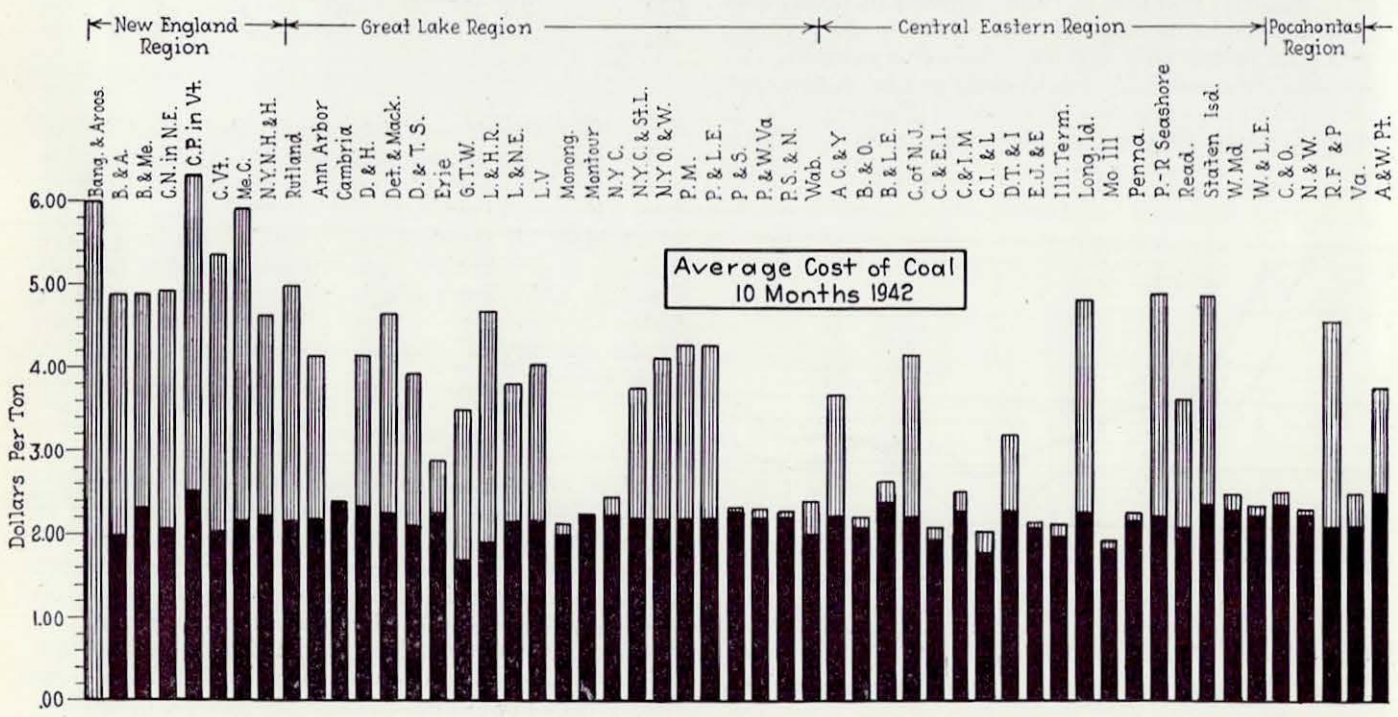
Railway Steel

Meanwhile, conferences over prices of various railway materials had been brought to a conclusion. In January, manufacturers of air brakes, car doors and some locomotive specialties cancelled price increases. In February, an increase of $2 a ton in freight car brake shoes was cancelled and the prices were restored to the October base, while a revised schedule of dollars-and-cents prices for couplers, bolsters and side frames was prepared in which October 1 to October 15, 1941, prices were agreed upon—later amended to permit charges for extras, repairs and adjustments in labor costs. Wire rope prices were also established at October 15 levels, and on September 7, alloy steel prices which had been established at the levels in March, 1942, under the general regulation were set back to levels of October 1 and October 15. On October 15, this was also done with manganese steel castings which had increased 10 per cent over the levels in the third quarter of 1941; and a similar procedure was followed with malleable casting prices in

A. A. R. Average Prices for Repairs to Foreign Cars* Exclusive of Stores Expense

	Unit Prices	Index Values—Based on October, 1938				
	Oct. 1942	Oct. 1942	Oct. 1941	Oct. 1940	Oct. 1939	Oct. 1938
Pipe couplings 1¼.....ea.	$.108	135	122	99	105	100
Pipe nipples 1¼ x 10....ea.	.122	124	108	89	97	100
Pipe unions 1¼ ground..ea.	.451	146	135	105	113	100
Pipe 1¼ .....ft.	.106	104	108	100	98	100
Bolts ¾ x 4½.....lb.	.050	106	104	87	91	100
Bolts 1¼ x 17.....lb.	.355	114	110	96	99	100
Bolts car ½ x 3 .....lb.	.016	95	94	98	98	100
Nuts sq.⅞ .....lb.	.020	125	125	101	101	100
Bar iron, com. .....lb.	.042	182	178	156	147	100
Bar steel, carbon .....lb.	.023	96	95	96	96	100
Brake hangers .....lb.	.087	116	109	115	115	100
Center plates .....lb.	.062	117	109	102	104	100
Brake shoes, 1935 std.....ea.	.594	117	117	110	104	100
Castings, grey iron .....lb.	.051	113	108	100	100	100
Castings, mall. .....lb.	.083	109	105	92	90	100
Castings, steel, to 100....lb.	.106	116	115	100	100	100
Castings, steel, over 100..lb.	.085	102	101	90	91	100
Chain, ½ and ⅝in.....lb.	.086	126	114	106	101	100
Couplers, E 5 x 7.....ea.	28.25	107	108	97	99	100
Couplers, E 6¼ x 8.....ea.	30.70	108	108	96	99	100
Galv. iron 24 g.....lb.	.037	98	97	97	97	100
Journal Box, 9" ..... ea.	8.67	120	118	102	100	100
Journal Box, 10".....ea.	10.09	123	119	103	101	100
Lag screws 100	1.803	110	110	95	100	100
Nails .....cwt.	2.795	104	101	97	94	100
Springs elliptical .....lb.	.071	104	102	102	100	100
Springs helical .....lb.	.053	104	105	104	105	100
Structural steel .....lb.	.023	100	100	100	100	100
Steel plate carb. .....lb.	.023	104	104	104	104	100
Steel plate H. T. .....lb.	.034	94	93	95	98	100
Steel plate copper .....lb.	.024	104	104	100	100	100
Wheels, C. I. 33".....cwt.	2.110	115	115	110	107	100
Wheels, W. S. 33" heavy..ea.	34.133	103	101	101	100	100
Wheels, W. S. 50 T light..ea.	19.85	117	117	112	108	100
Wheels, W. S. 70 T light..ea.	21.59	116	116	112	107	100
Axles .....cwt.	3.791	101	101	102	103	100
Brake beams No. 15.....ea.	6.285	108	104	98	98	100
Draft gear .....set	38.14	104	111	99	99	100
Journal brass .....lb.	.145	122	122	102	100	100
Paint, car .....gal.	2.425	123	118	110	108	100
Rubber belt 5 x 5 .....ft.	.401	98	97	97	97	100
Elec. bulbs 50 w..... ea.	.214	95	97	102	101	100
Lubrication, pass. car....gal.	.184	107	104	101	102	100
Lumber, heavy .....M ft.	56.29	146	130	115	113	100
Lumber, light .....M ft.	49.42	169	159	131	123	100
Scrap, ferrous .....n.t.	17.90	145	142	147	144	100
Scrap, non-ferrous .....n.t.	211.47	138	134	109	106	100

* Equals invoice price plus freight.

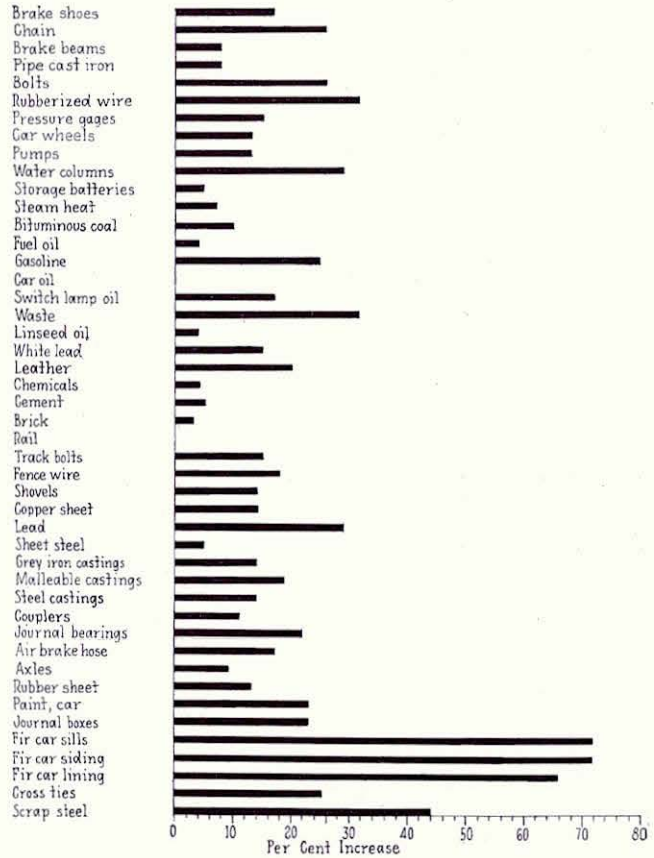


Average Cost per ton of Coal for Locomotives—10 Months of 1942

the schedule completed on October 21, except that allowances were made for actual increases in material costs and labor and overhead on articles which were not made in the base period. Grey iron casting prices which had been under study up to October 26 were also set back beyond the March prices, in this case being established at the highest prices charged between August, 1941, and February 1, except with new materials which may be based on the direct labor rates, material costs, overhead and profit margins on February 1, 1942.

On March 28, 6 per cent increases in freight rates on various materials became effective, which brought revisions in some schedules of iron and steel. In general, mills and factories were required to absorb the increase on incoming shipments, but were permitted to add increases in the transportation of outgoing shipments to the cost of outgoing shipments and were permitted adjustments on shipments made beyond the normal shipping area. In August, railroads were allowed to pass on to consumers the increased transportation costs in moving allocated shipments of scrap from railroads operating in a basing point to an off-line consumer.

On June 30, the problem of extras in steel buying led OPA to launch an investigation of conversion and processing charges on iron and steel and to issue an amendment to its Iron and Steel schedule establishing uni-



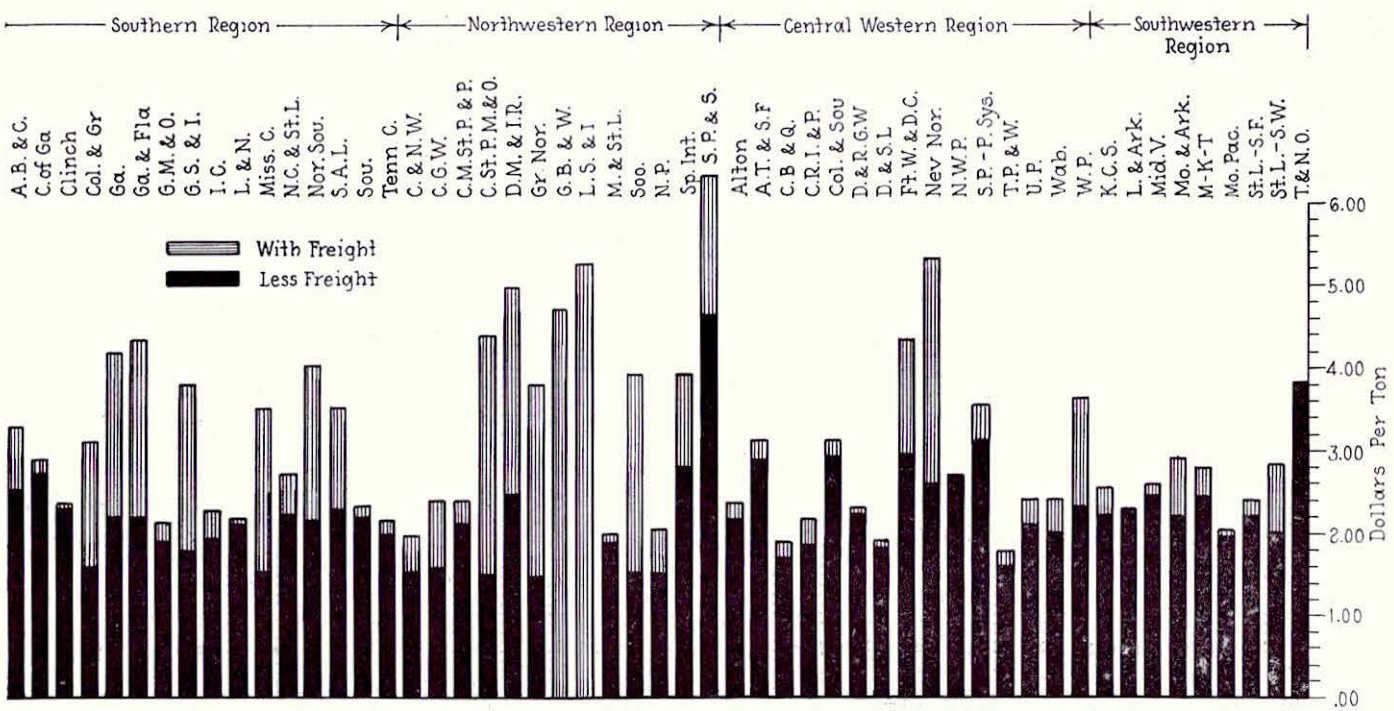
Increases in Average Costs of Selected Railway Items since 1938 or 1939

Annual Average Cost of Coal Consumed by Locomotives—Class I Railroads*

Dollars Per Net Ton

	United States		Eastern		Pocahontas		Southern		Western	
	A	B	A	B	A	B	A	B	A	B
1924		3.03		3.11		2.13		2.78		3.22
1925		2.72		2.75		1.78		2.62		3.02
1926		2.63		2.67		1.82		2.31		2.94
1927	2.21	2.66	2.09	2.70	1.68	1.76	1.85	2.26	2.73	3.00
1928	2.12	2.53	1.95	2.55	1.61	1.69	1.81	2.19	2.66	2.82
1929	2.01	2.40	1.88	2.45	1.60	1.69	1.72	2.10	2.47	2.61
1930	1.95	2.34	1.83	2.39	1.60	1.68	1.67	2.06	2.39	2.53
1931	1.83	2.21	1.67	2.22	1.57	1.66	1.56	1.95	2.32	2.45
1932	1.66	2.05	1.46	2.04	1.49	1.58	1.41	1.79	2.17	2.31
1933	1.58	1.96	1.38	1.95	1.43	1.51	1.38	1.75	2.06	2.17
1934	1.83	2.20	1.75	2.33	1.69	1.77	1.64	2.00	2.10	2.19
1935	1.89	2.27	1.82	2.40	1.76	1.85	1.75	2.12	2.11	2.21
1936	1.79	2.34	1.78	2.48	1.75	1.93	1.74	2.21	1.83	2.28
1937	1.89	2.43	1.90	2.55	1.90	2.09	1.85	2.31	1.89	2.36
1938	1.92	2.51	1.94	2.68	1.97	2.19	1.90	2.41	1.89	2.37
1939	1.91	2.49	1.93	2.67	1.98	2.18	1.89	2.40	1.86	2.32
1940	1.88	2.45	1.91	2.61	1.96	2.17	1.89	2.37	1.82	2.30
1941	2.02	2.57	2.06	2.74	2.17	2.37	2.03	2.52	1.92	2.35
1942#	2.11	2.68	2.15	2.84	2.30	2.57	2.15	2.68	1.97	2.41

* I. C. C.
A equals average mine price.
B equals cost of coal consumed, including freight and handling costs.
9 Mos. I. C. C.



With and without Freight, as Reported to the I. C. C.

centered, on the one hand, in the laws which had been passed to save the coal producers from themselves by putting a floor under coal prices; and, on the other, in the involved administration of the act—first, by the Bituminous Coal Commission, and then by its successor, the Bituminous Coal Division of the Department of the Interior. At present, however, coal prices not only have a floor beneath, but a ceiling over them since OPA decided to take a hand in the coal business.

Last January, after a long investigation of coal production costs which at first held out the promise of a substantial reduction in prices to railroads, the Department of the Interior reversed itself by announcing a basis for minimum costs which averaged 10 cents a ton higher than the previous base, and railroads watched the work of the Bituminous Coal Division in establishing the new minimum prices until the hearings were concluded last June. In the meantime, OPA had also taken an interest in coal and issued a maximum price regulation on railroad and other coal which became effective May 18, and established ceilings, ranging from 25 cents to 60 cents a ton, above the authorized minimum prices on railroad

Average Cost of Fuel Consumed—10 Months 1942

	Coal		Fuel		
	Less Frt. Per Ton Dollars	With Frt. Per Ton Dollars	Oil Per Bbl. Dollars	Gaso. Per Gal. Cents	Diesel Per Gal. Cents
Line Haul Carriers					
Akron, Canton & Young	2.24	3.67	3.14	15.53	6.39
Ala. Great Southern	2.59	2.83	...	19.13	4.89
Alton	2.17	2.38	1.83	7.50	4.72
Ann Arbor	2.09	4.08	2.09	11.47	5.02
Atch. Top. & Santa Fe	2.89	3.08	.97	6.56	4.21
Atlanta & West Point	2.52	3.81	...	...	...
Atlanta, Birm. & Coast	2.53	3.27	...	...	...
Atlantic Coast Line	2.18	3.89	1.63	...	5.74
Baltimore & Ohio	2.12	2.21	1.90	10.09	5.69
Bangor & Aroostook	...	6.12	...	...	...
Bessemer & Lake Erie	2.41	2.64	2.43	14.12	9.50
Boston & Albany	1.99	4.93	3.32	12.61	6.29
Boston & Maine	2.24	4.97	2.53	11.94	6.54
Burlington-Rock Island	...	...	.86	.06	.04
Cambria & Indiana	2.40	...	...	...	...
Canadian National in N. E.	2.05	4.93	4.31	18.03	...
Canadian Pacific in Vt.	2.53	6.28	...	17.39	...
Central of Georgia	2.74	2.93	1.61	9.08	5.43
Central of New Jersey	2.20	4.19	2.73	14.73	6.23
Central Vermont	2.01	5.33	3.20	13.65	6.84
Char. & Western Carol.	2.26	3.90	...	...	...
Chesapeake & Ohio	2.43	2.51	1.93	6.00	...
Chicago & Eastern Ill.	1.93	2.07	1.68	9.48	5.36
Chicago & Ill. Midland	2.27	2.52	2.42	12.57	...
Chicago & North Western	1.49	1.94	.77	9.29	5.36
Chicago, Burl. & Quincy	1.69	1.90	.67	6.76	4.26
Chicago Great Western	1.55	2.41	1.19	7.21	4.64
Chicago, Ind. & Louisville	1.88	2.03	2.22	...	5.33
Chicago, Mil. S. P. & Pac.	2.12	2.43	.94	7.32	4.47
Chicago, R. I. & Pac.	1.85	2.19	.77	10.33	4.18
Chicago, St. P., Minn. & Om.	1.47	4.41	1.46	7.63	4.02
Cin., New Orleans & Tex. Pac.	2.31	2.71	...	...	5.27
Clinchfield	2.28	2.36	2.12	7.39	...
Colorado & Southern	2.93	3.09	.79	7.23	4.64
Colorado & Wyoming	3.14	4.59	...	.14	...
Columbus & Greenville	1.58	3.10	...	7.87	...
Delaware & Hudson	2.27	4.16	2.28	...	...
Delaware, Lack. & Western	2.23	3.72	2.50	...	6.11
Denver & Rio Grande Western	2.24	2.30	2.30	11.78	5.91
Denver & Salt Lake	1.87	1.91	...	8.89	5.23
Detroit & Mackinac	2.25	4.65	1.55	.07	...
Detroit & Toledo Shore	2.10	3.96	3.15	...	...
Detroit, Toledo & Ironton	2.31	3.23	2.05	15.32	5.51
Duluth, Miss. & Iron Range	2.49	4.98	2.94	11.09	...
Duluth, S. S. & Atlantic	...	4.87	...	14.51	...
Duluth, Winnipeg & Pac.	...	4.97	3.27	15.07	...
Elgin, Joliet & Eastern	2.08	2.12	2.07	11.41	5.21
Erie	2.26	2.87	2.25	9.09	6.06
Florida East Coast	...	...	1.47	...	5.47
Fort Worth & Denver City	2.97	4.31	.78	6.35	4.04
Georgia	2.20	4.21	...	20.24	...
Georgia & Florida	2.23	4.35	...	26.11	...
Ga. Southern & Florida	2.31	4.36	...	19.09	5.57
Grand Trunk Western	1.74	3.54	1.85	14.08	6.34
Great Northern	1.52	3.80	.81	7.26	4.37
Green Bay & Western	...	4.68	...	...	5.98
Gulf & Ship Island	1.77	3.83	1.61	14.70	...
Gulf Coast & Subsidiaries	...	...	.84	9.19	3.93
Gulf, Mobile & Ohio	1.88	2.12	...	8.21	4.73
Illinois Central	1.92	2.29	1.63	13.58	4.67
Illinois Terminal	1.96	2.10	1.92	14.50	7.84
International-Great Nor.	...	...	.80	...	3.80
International of Maine	2.35	5.97	...	19.55	...
Kansas City Southern	2.26	2.54	.84	...	4.30
Kansas, Okla. & Gulf	2.65	2.97	1.48	12.89	...
Lake Superior & Ishpeming	...	5.26	...	...	...
Lehigh & Hudson River	1.95	4.73	...	13.87	...
Lehigh & New England	2.17	3.91	2.16	16.72	...
Lehigh Valley	2.08	4.04	2.61	10.69	6.22
Long Island	2.31	4.86	1.73	14.00	5.59
Louisiana & Arkansas	2.30	...	.79	17.80	3.98
Louisville & Nashville	2.09	2.22	1.99	18.03	4.66
Maine Central	2.18	5.91	2.53	13.33	7.16
Midland Valley	2.43	2.60	1.21	12.11	...
Minneapolis & St. Louis	1.84	1.95	1.20	6.94	4.58
Minn., St. P. & S. S. M.	1.57	3.93	1.60	8.37	5.31
Mississippi Central	1.53	3.52	...	13.52	...
Missouri & Arkansas	2.19	2.88	...	7.97	2.17
Missouri-Illinois	1.82	1.89	...	7.09	...
Missouri-Kans.-Tex.	2.44	2.80	.82	6.29	...
Missouri Pacific	1.89	2.00	.79	6.37	3.66
Monongahela	2.00	2.13	3.20	17.90	...
Montour	2.14	2.15	...	...	...
Nashville, Chat. & St. L.	2.25	2.70	1.31	6.62	3.60
Nevada Northern	2.56	5.30	...	2.00	...
New Orleans & N. E.	2.56	3.99	1.57	18.20	4.83
New York Central	2.13	2.44	1.64	12.27	5.83
New York, Chicago & St. L.	2.18	3.77	2.05	...	9.07
New York Connecting	...	...	1.61	...	...
New York, New Haven & Hart.	2.23	4.64	1.73	14.55	6.07
New York, Ont. & Western	2.20	4.14	...	...	8.80
New York, Susq. & Western	2.20	4.82	...	11.90	6.32
Norfolk & Western	2.24	2.30	1.87	7.31	...
Norfolk Southern	2.15	4.06	...	10.95	...
Northern Pacific	1.57	2.07	.92	10.67	5.22
Northwestern Pacific	2.77	...	.88	8.87	5.51
Oklahoma City-Ada-Atoka	...	3.27	1.40	...	...
Pennsylvania	2.19	2.30	2.05	14.40	6.68
Penn.-Reading Seashore	2.16	4.95	1.53	14.71	...
Pere Marquette	2.20	4.27	2.05	10.91	6.42
Pittsburgh & Lake Erie	2.22	2.44	2.50	17.30	...
Pittsburg & Shawmut	2.29	2.34	3.94	15.93	...
Pittsburgh & West Virginia	2.22	2.29	...	...	...
Pitts. Shawmut & Northern	2.35	2.34	...	...	...
Reading	2.11	3.66	2.66	15.08	6.18
Richmond, Fred. & Potomac	2.09	4.63	...	10.87	5.86
Rutland	2.16	5.02	2.62	...	...
St. Louis-San Francisco	2.21	2.38	.84	11.34	4.29
St. Louis-San Francisco & Tex.	...	...	.86	11.43	...
St. Louis Southwestern	1.98	2.89	.85	6.75	3.79
Seaboard Air Line	2.28	3.54	1.57	16.24	5.97
Southern	2.21	2.31	1.79	21.03	5.04
Southern Pac.-Pac. Sys.	3.13	3.56	1.02	12.39	4.42
Spokane International	2.80	3.95	...	...	...
Spokane, Port. & Seattle	4.66	6.32	.88	14.32	4.21
Staten Isl. Rapid Transit	2.38	4.91	...	...	...
Tennessee Central	1.97	2.15	2.68	...	6.47
Texas & New Orleans	3.82	...	.82	8.26	3.86
Texas & Pacific	...	...	.82	...	...
Texas Mexican	...	...	1.24	...	3.26
Toledo, Peoria & Western	1.65	1.84	3.04	12.47	8.00
Union Pacific	2.07	2.22	1.35	9.09	4.24
Utah	1.94	2.09	2.63	17.33	...
Virginian	2.08	2.52	...	...	...
Wabash	2.02	2.41	1.90	8.58	4.85
Western Maryland	2.30	2.50	2.57	15.22	8.00
Western Pacific	2.33	3.62	.82	11.47	5.20
Wheeling & Lake Erie	2.24	2.36	2.21	13.32	5.46
Switching and Terminal Companies					
Aliquippa & Southern	...	3.12	...	...	...
Alton & Southern	1.76	2.66	...	...	...
Baltimore & Ohio C. T.	2.19	4.02	...	...	5.32
Belt of Chicago	1.68	3.12	3.98	.13	.05
Birmingham Southern	...	...	...	...	3.77
Brooklyn Eastern	...	...	1.60	...	...
Chicago & Western Indiana	1.57	3.31	2.09	.14	...
Chicago River & Indiana	1.67	3.41	...	...	5.22
Cincinnati Union Terminal	2.07	4.03	...	...	...
Conemaugh & Black Lick	2.72	2.72	...	...	...
Detroit Terminal	2.04	4.29	...	16.02	...
Houston Belt & Terminal	...	...	.85	...	.04
Indiana Harbor Belt	1.80	3.45	2.09	...	...
Indianapolis Union	1.89	3.16	2.44	...	...
Kansas City Terminal	1.85	3.80	1.01	...	.05
Kentucky & Indiana Terminal	1.87	3.26	...	...	.05
Lake Erie & Eastern	...	3.98	...	...	...
Lake Terminal	2.31	3.87	...	15.53	...
Minnesota Transfer	...	5.91	...	...	6.76
Monongahela Connecting	...	4.09	...	...	7.03
New Orleans Terminal	2.55	5.04	...	...	4.05
Newburgh & South Shore	2.22	3.80	...	11.96	6.26
Northern Pac. Term. of Ore	...	...	.99	...	.05
Ogden Union	2.33	4.38	.84	16.89	...
Peoria & Pekin Union	1.86	2.52	3.12	15.96	4.93
Portland Terminal	2.14	5.77	2.92	14.74	6.25
St. Paul Union Depot	...	6.54	...	9.27	6.44
Terminal of St. Louis	2.57	3.26	3.21	...	.05
Tex. Pac.-Mo. P. Term. of N. O.	2.05	...	.88	.18	.04
Toledo Terminal	...	4.09	...	...	...
Union of Penna.	2.71	2.77	3.18	...	7.15
Washington Terminal	2.31	4.94	...	...	...

* As reported to I. C. C.

the schedule completed on October 21, except that allowances were made for actual increases in material costs and labor and overhead on articles which were not made in the base period. Grey iron casting prices which had been under study up to October 26 were also set back beyond the March prices, in this case being established at the highest prices charged between August, 1941, and February 1, except with new materials which may be based on the direct labor rates, material costs, overhead and profit margins on February 1, 1942.

On March 28, 6 per cent increases in freight rates on various materials became effective, which brought revisions in some schedules of iron and steel. In general, mills and factories were required to absorb the increase on incoming shipments, but were permitted to add increases in the transportation of outgoing shipments to the cost of outgoing shipments and were permitted adjustments on shipments made beyond the normal shipping area. In August, railroads were allowed to pass on to consumers the increased transportation costs in moving allocated shipments of scrap from railroads operating in a basing point to an off-line consumer.

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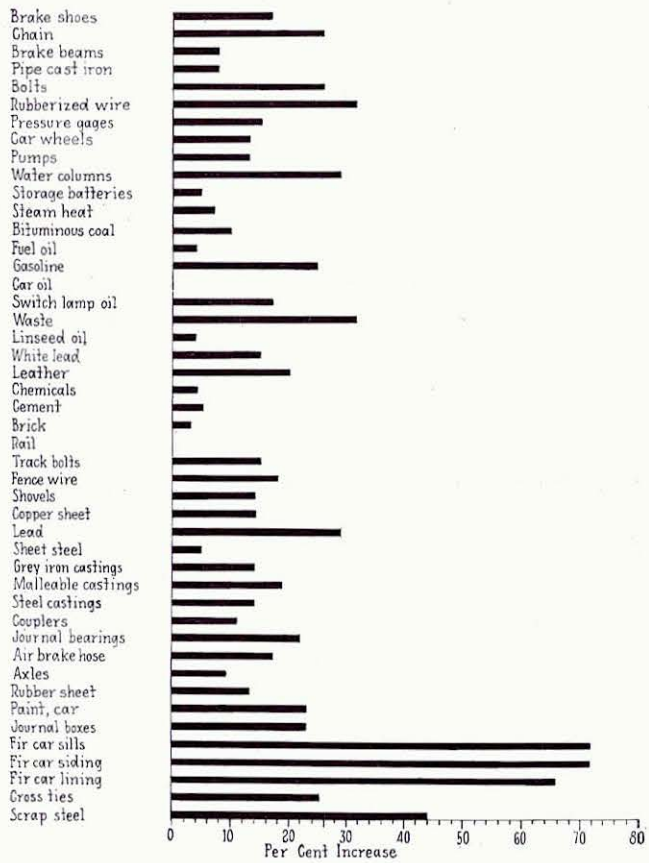


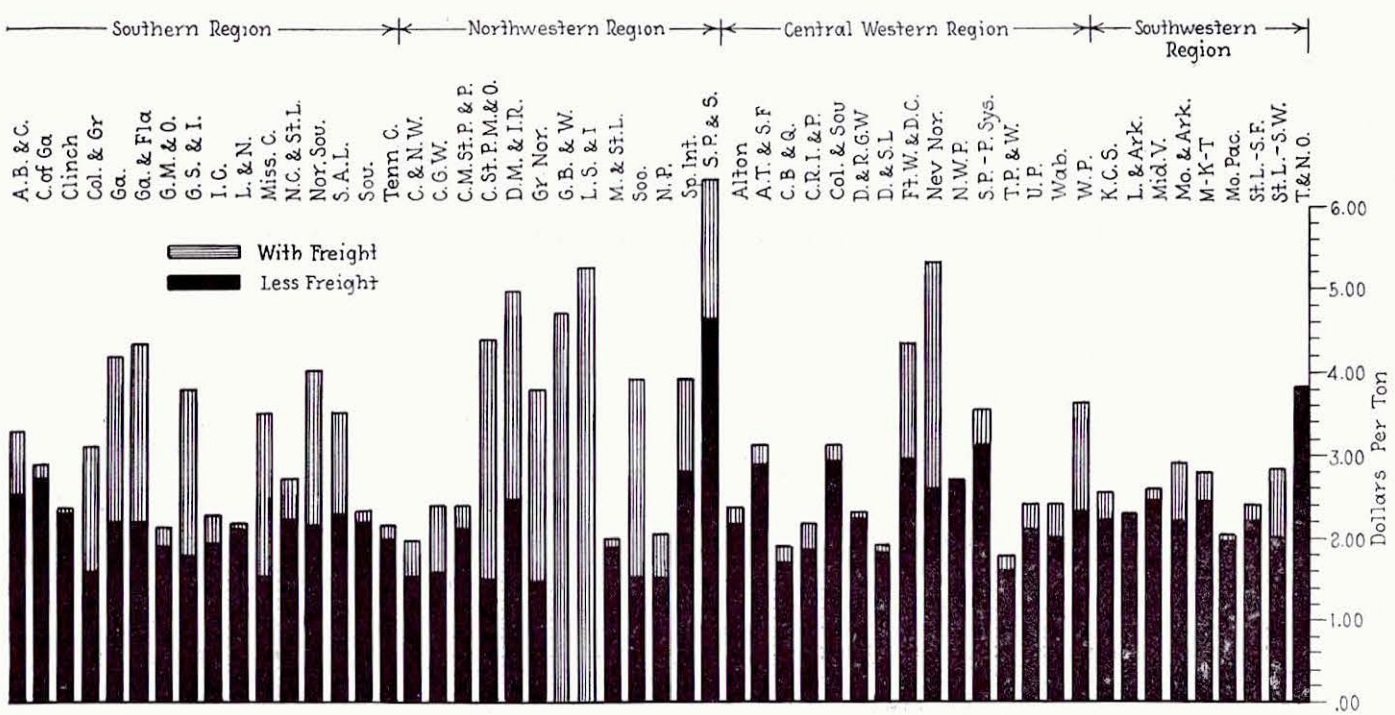
Increases in Average Costs of Selected Railway Items since 1938 or 1939

Annual Average Cost of Coal Consumed by Locomotives—Class I Railroads*

Dollars Per Net Ton

	United States		Eastern		Pocahontas		Southern		Western	
	A	B	A	B	A	B	A	B	A	B
1924		3.03		3.11		2.13		2.78		3.22
1925		2.72		2.75		1.78		2.62		3.02
1926		2.63		2.67		1.82		2.31		2.94
1927	2.21	2.66	2.09	2.70	1.68	1.76	1.85	2.26	2.73	3.00
1928	2.12	2.53	1.95	2.55	1.61	1.69	1.81	2.19	2.66	2.82
1929	2.01	2.40	1.88	2.45	1.60	1.69	1.72	2.10	2.47	2.61
1930	1.95	2.34	1.83	2.39	1.60	1.68	1.67	2.06	2.39	2.53
1931	1.83	2.21	1.67	2.22	1.57	1.66	1.56	1.95	2.32	2.45
1932	1.66	2.05	1.46	2.04	1.49	1.58	1.41	1.79	2.17	2.31
1933	1.58	1.96	1.38	1.95	1.43	1.51	1.38	1.75	2.06	2.17
1934	1.83	2.20	1.75	2.33	1.69	1.77	1.64	2.00	2.10	2.19
1935	1.89	2.27	1.82	2.40	1.76	1.85	1.75	2.12	2.11	2.21
1936	1.79	2.34	1.78	2.48	1.75	1.93	1.74	2.21	1.83	2.28
1937	1.89	2.43	1.90	2.55	1.90	2.09	1.85	2.31	1.89	2.36
1938	1.92	2.51	1.94	2.68	1.97	2.19	1.90	2.41	1.89	2.37
1939	1.91	2.49	1.93	2.67	1.98	2.18	1.89	2.40	1.86	2.32
1940	1.88	2.45	1.91	2.61	1.96	2.17	1.89	2.37	1.82	2.30
1941	2.02	2.57	2.06	2.74	2.17	2.37	2.03	2.52	1.92	2.35
1942#	2.11	2.68	2.15	2.84	2.30	2.57	2.15	2.68	1.97	2.41

* I. C. C.
A equals average mine price.
B equals cost of coal consumed, including freight and handling costs.
9 Mos. I. C. C.



With and without Freight, as Reported to the I. C. C.

Average Unit Costs of Railroad Materials 1927-1942*

	Description	Unit	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942 First quarter	1942 Mid-year	1942 Last quarter	1942 Average	Per Cent of 1941	Per Cent of 1939	Per Cent of 1929
Track Materials																								
Rail		N.t.	$43.00	$43.00	$43.00	$43.00	$43.00	$42.00	$38.79	$36.37	$36.37	$36.375	$41.33	$41.66	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	100	100	93
Tie plates	Steel	N.t.	45.98	42.43	42.10	41.22	38.88	36.40	36.64	39.56	38.73	39.91	44.93	45.45	43.70	43.74	44.00	44.15	44.15	44.15	44.15	100	99	105
Track bolts	Heat-treated	Cwt.	4.00	3.83	3.75	3.94	3.74	3.42	3.52	3.71	3.71	3.87	4.40	4.50	4.31	4.34	4.60	4.96	4.96	4.96	4.96	107	115	132
Track spikes	High-carbon steel	Cwt.	2.80	2.76	2.71	2.68	2.57	2.45	2.32	2.46	2.46	2.68	3.09	3.54	3.03	3.02	3.02	3.03	3.05	3.05	3.05	101	100	112
Track shovels	No. 2 carbon steel	Doz.	12.95	13.82	11.28	10.02	9.98	10.93	11.53	13.20	13.26	12.70	13.02	13.70	13.51	13.63	14.10	15.44	15.27	15.44	15.38	107	114	136
Wire fence	26-49 in. woven	Rod	.467	.488	.426	.428	.396	.383	.370	.402	.416	.403	.502	.516	.490	.503	.49	.548	.564	.564	.56	114	118	131
Steel, structural	Angles	Cwt.	1.98	1.98	2.35	1.98	1.84	1.73	1.75	1.93	1.96	2.19	2.48	2.48	2.37	2.51	2.55	2.56	2.56	2.56	2.56	100	110	110
Pipe, cast-iron	12 in. Class B	N.t.	41.13	41.13	39.41	40.37	35.58	33.94	37.91	40.80	40.60	42.25	42.99	50.58	48.57	49.25	46.00	52.50	55.70	55.70	52.66	121	108	134
Pipe, culvert	24 in. corr.	Ft.	...	...	...	...	...	1.95	1.74	2.02	2.16	2.19	2.54	2.59	2.34	2.38	2.52	2.59	2.74	2.74	2.66	105	113	...
Ballast	Crushed rock	C.y.	...	...	...	...	...	...	...	...	...	...	1.05	.88	.89	.89	.88	1.04	1.09	1.09	1.07	121	120	...
Locomotive and Car Materials																								
Bolts, with nuts	¾ x 6, machine	100	5.13	5.02	4.87	4.81	4.20	4.04	4.70	4.59	4.08	3.97	4.93	4.75	4.36	4.52	4.90	5.45	5.49	5.49	5.48	112	126	112
Boiler tubes	2 in. No. 11, steel	Ft.	.172	.172	.174	.154	.152	.152	.156	.161	.161	.158	.166	.165	.154	.158	.157	.159	.159	.159	.159	101	103	93
Bar steel	Open-hearth	Cwt.b.	2.13	2.58	2.17	1.85	1.80	1.72	1.73	1.84	2.01	2.09	2.49	2.47	2.27	2.18	2.20	2.29	2.29	2.29	2.29	104	101	105
Steel	High-speed tool	Lb.b.	.59	.58	.57	.66	.52	.49	.52	.60	.61	.64	.78	.80	.77	.80	.73	.80	.78	.78	.79	108	102	135
Steel	Boiler	Cwt.b.	2.01	2.00	2.33	2.01	1.86	1.73	1.82	2.10	2.05	2.12	2.53	2.40	2.25	2.20	2.24	2.33	2.33	2.33	2.33	104	104	100
Steel	Spring	Cwt.b.	2.74	2.63	2.84	2.62	2.42	2.18	2.23	2.31	2.36	2.54	3.03	2.94	2.81	2.88	2.97	2.73	2.73	2.73	2.90	100	105	104
Steel	24-gage black	Cwt.	3.20	2.99	3.25	2.90	2.65	2.69	2.68	2.72	2.81	2.82	3.28	3.13	2.80	2.91	2.84	2.53	2.53	2.53	2.53	87	94	81
Pig iron	No. 1	G.t.	20.50	20.50	17.35	16.61	15.37	14.85	15.74	18.30	18.59	19.47	22.13	20.97	19.85	20.97	21.99	20.30	20.30	20.30	20.30	95	102	114
Crank pins	Carbon steel	Lb.b.	...	...	...	...	...	...	...	...	...	...	...	...	...	.069	.815	.845	.847	.847	.846	104	...	...
Brake shoes	Loco. driving	N.t.	61.70	61.70	59.54	60.00	56.28	54.28	54.50	56.30	56.65	56.65	61.36	62.70	63.90	65.91	69.20	70.50	70.50	70.50	70.50	101	110	118
Brake shoes	Freight car	N.t.	36.93	39.98	37.55	35.42	35.12	32.70	33.40	35.00	36.00	37.77	48.27	48.50	48.50	50.10	54.70	57.00	57.00	57.00	57.00	104	117	152
Castings, gray iron	Green sand	Cwt.	3.86	3.97	4.12	4.12	4.00	3.82	3.82	3.90	3.87	4.14	4.25	4.15	4.10	4.20	4.16	4.62	4.71	4.70	4.69	112	114	114
Castings, malleable	7-15 lb. 25-100	Cwt.	9.13	8.50	8.68	8.27	7.68	7.59	7.42	8.99	8.29	8.42	10.38	10.50	10.60	11.31	12.60	12.16	12.77	12.77	12.56	100	119	145
Castings, steel	25-50 lb. under 50	Cwt.	8.64	7.97	8.32	8.46	7.73	7.37	7.25	8.52	8.49	8.52	11.91	12.50	12.10	12.33	13.30	13.84	13.84	13.84	13.84	104	114	167
Couplers, car	5 x 7 x 6½ AAR-E	Pr.	41.20	40.20	40.20	41.20	39.20	38.13	37.20	40.20	40.20	42.43	51.70	51.50	51.00	50.87	53.50	57.88	57.93	57.93	59.91	111	117	149
Wheels, car	33 in. chilled iron	Cwt.	...	...	...	...	...	...	1.35	1.40	1.40	1.40	1.50	1.24	1.27	1.40	1.44	1.43	1.43	1.43	1.43	100	113	...
Wheels, car, steel	33 in. tender 800-lb.	Ea.	...	...	...	...	...	...	...	...	...	...	30.60	34.53	33.64	34.14	34.12	34.12	34.12	34.12	34.12	100	101	...
Axles, loco	Driving, carbon	Cwt.	5.16	5.21	4.84	4.29	4.75	4.55	4.56	4.90	5.06	5.26	5.94	5.80	5.83	5.73	5.96	5.91	5.91	5.91	5.91	100	102	123
Axles, car	5 x 9, rough turned	Cwt.	2.94	2.94	2.94	2.88	2.88	2.75	2.53	2.89	2.98	3.09	3.61	3.54	3.41	3.50	3.53	3.58	3.58	3.58	3.58	101	105	121
Tires, frt. loco	33 in., rough bored	Cwt.	6.11	6.11	5.84	6.22	6.03	5.86	5.55	5.67	5.97	5.83	6.21	6.20	6.12	6.08	6.84	6.55	6.55	6.55	6.55	96	107	112
Pipe	1 in. black steel	Ft.	.076	.069	.066	.067	.069	.063	.063	.066	.069	.062	.073	.074	.070	.067	.067	.064	.064	.064	.065	97	92	98
Wire nails	Common	Cwt.	2.58	2.62	2.62	2.29	2.07	2.18	2.23	2.62	2.83	2.28	2.71	2.72	2.51	2.61	2.65	2.75	2.75	2.75	2.75	104	110	105
Pig lead	Virgin	Cwt.	7.04	6.43	6.95	5.64	4.42	3.53	4.17	4.04	4.44	4.87	6.34	5.12	5.30	5.33	6.25	6.79	6.88	6.88	6.85	110	129	99
Copper	Sheet, soft	Lb.	.218	.23	.27	.259	.181	.180	.169	.180	.211	.212	.252	.249	.245	.244	.246	.239	.239	.239	.239	98	98	89
Journal bearings	AAR	Lb.	.142	.141	.167	.149	.10	.07	.081	.093	.096	.106	.139	.114	.122	.130	.141	.158	.162	.161	.160	114	131	97
Wire, copper	No. 9 bare	Lb.	.149	.167	.195	.163	.115	.100	.113	.138	.141	.142	.185	.163	.165	.170	.175	.184	.184	1.83	.184	105	111	95
Miscellaneous																								
Boiler lagging	1¼ x 6 x 36 mag	Sq. ft.	.21	.22	.236	.160	.155	.156	.156	.157	.160	.154	.183	.182	.183	.183	.194	.194	.194	.194	.194	100	106	82
Fire brick	Soft	M	41.74	43.08	41.73	41.85	39.29	34.70	37.20	44.58	45.26	45.64	50.42	49.75	49.20	46.74	53.60	55.10	55.10	55.00	55.05	102	112	132
Hose, air brake	Air brake, 1¾ x 22	Ft.	.48	.46	.44	.45	.37	.33	.31	.39	.41	.40	.44	.38	.36	.34	.36	.42	.42	.42	.42	117	117	96
Leather	Belting, 6 in. double	Ft.	1.22	1.35	1.39	1.39	1.23	1.27	1.17	1.32	1.31	1.32	1.30	1.26	1.24	1.30	1.35	1.40	1.40	1.40	1.40	105	113	101
Rope	¾ in. manila	Lb.	.217	.199	.199	.189	.153	.142	.127	.142	.130	.167	.180	.168	.154	.170	.170	.175	.175	.175	.175	103	114	89
Cable	¾ in. 6 x 19 steel	Ft.	.125	.119	.144	.14	.143	.132	.137	.155	.161	.161	.174	.174	.163	.164	.148	.146	.148	.150	.148	100	91	103
Rubber, red	⅛ in. sheet packing	Lb.	.32	.28	.247	.25	.225	.176	.172	.177	.167	.131	.141	.137	.135	.16	.148	.153	.153	.153	.153	103	113	62
Oil	Switch lamp—tanks	Gal.	.096	.09	.087	.117	.062	.061	.051	.053	.052	.055	.055	.059	.055	.058	.061	.064	.063	.063	.063	103	113	72
Oil	Car-tank lots	Gal.	.180	.157	.157	.163	.138	.127	.134	.135	.132	.141	.132	.144	.147	.142	.143	.147	.147	.147	.147	103	100	94
Grease	Driving box	Lb.	.160	.122	.125	.131	.122	.118	.109	.104	.103	.102	.101	.100	.099	.100	.104	.112	.113	.116	.116	111	117	93
Waste	Colored cotton	Lb.	.098	.091	.086	.084	.076	.051	.057	.065	.057	.073	.079	.058	.060	.067	.068	.082	.080	.076	.079	115	132	92
Creosote oil	Tank lots	Gal.	.157	.157	.145	.130	.115	.108	.093	.106	.116	.109	.123	.125	.130	.122	.123	.145	.148	.148	.147	118	113	101
Welding electrodes	⅜" 20 ton lots	Cwt.	...	...	...	...	...	...	...	...	...	...	...	...	...	6.18	5.67	6.22	6.22	6.22	6.22	110	...	...
Glass	24 x 24 dsa	Box	5.23	5.10	5.76	5.84	4.80	4.71	5.18	4.59	5.03	4.81	5.60	5.25	5.06	5.00	5.03	5.40	5.40	5.40	5.40	106	106	94
Freight car paint	Mineral brown	Gal.	...	...	...	...	...	...	...	...	...	...	...	...	...	.95	.95	.98	.98	1.02	1.00	105	...	...
Linseed oil	Boiled	Lb.	.088	.093	.117	.120	.09	.068	.087	.095	.103	.104	.117	.10	.096	.097	.83	.88	.85	1.00	.94	113	104	80
White lead	In oil—100 lb. keg	Lb.	.11	.102	.104	.106	.107	.088	.08	.081	.085	.085	.100	.086	.091	.097	.100	1.06	1.05	1.05	1.05	105	115	110
Cement, Portland	In paper	Bbl.	2.21	1.85	1.87	1.76	1.42	1.42	1.80	1.95	2.16	2.02	1.98	1.98	1.99	1.97	1.97	2.10	2.10	2.10	2.10	106	105	112
Roofing		Roll	...	...	...	...	...	...	...	...	...	...	...	...	...	1.44	1.48	1.78	1.77	1.77	1.77	110	...	...
Soda ash	Water softening	Cwt.	1.33	1.40	1.46	1.56	1.55	1.30	1.21	1.31	1.32	1.30	1.20	1.17	1.20	1.21	1.25	1.25	1.25	1.25	1.25	100	104	86
Hydrated lime	Water softening	N.t.	13.63	11.99	11.96	9.73	9.53	9.49	8.35	8.50	8.48	8.59	9.47	9.60	8.46	8.05	8.25	8.25	8.25	8.25	8.25	100	98	70
Oxygen		100 Cu. ft.	1.29	1.04	1.03	1.05	1.06	1.02	1.04	1.10	1.06	.94	.91	.90	.82	.86	.84	.88	.88	.88	.88	104	107	85
Incandescent lamps	100 W., 110 V. frosted	Ea.	...	...	...	...	...	...	...	...	...	...	.161	.128	.116	.111	.137	.137	.137	.137	.137	100	124	...
Waybills		M	...	...	...	...	...	...	...	...	...	...	...	...	...	1.73	1.61	1.88	1.88	1.88	1.88	116	...	...
Lanterns, hand	Clear globes	Doz.	...	...	14.80	14.80	14.80	14.80	15.10	16.00	16.00	16.00	16.00	16.75	16.75	16.75	16.83	16.83	16.83	16.83	16.83	100	100	114
Forest Products																								
Car siding	1x6x9 B&B fir	M.ft.	...	...	...	...	...	18.76	25.14	31.40	32.10	32.50	34.16	30.56	35.78	45.56	...	...	...	...	...	...	...	...
Car siding	1x6x9 B&B pine	M.ft.	...	...	...	...	...	...	...	...	...	...	47.11	39.83	40.91	44.50	57.00	62.50	62.50	62.50	62.50	110	153	...
Car sheeting	2x6x18 B&B fir	M.ft.	...	...	...	...	...	21.83	36.75	45.00	37.29	47.22	41.50	30.40	35.20	41.60	60.00	67.09	68.63	68.86	68.15	112	190	...
Car sheeting	2x6x18 B&B pine	M.ft.	...	...	...	...	...	...	...	...	...	...	45.52	40.36	40.73	48.00	...	...	...	...	...	...	...	...
Car sills	6x6 com. rgh., fir	M.ft.	...	...	...	...	...	10.23	13.00	19.00	17.98	20.20	23.96	20.80	20.37	23.00	36.80	47.50	53.70	51.50	51.50	140	250	...
Br. stringers	16"x32' or less, fir	M.ft.	...	...	...	...	...	12.52	15.70	23.50	21.15	20.69	23.23	19.61	19.76	23.80	34.10	48.50	51.00	49.00	49.00	143	250	...
Crossties	7x9x8'6", fir	Ea.	.60	.60	.67	.80	.50	.50	.49	.53	.49	.53	.61	.53	.42	.52	...	1.00	1.00	1.00	1.00	...	...	...
Crossties	7x9x8'6", pine	Ea.	.67	.67	.67	.77	.65	.73	.64	.62	.57	.72	.77	.73	.75	.80	.95	1.08	1.08	1.15	1.10	116	147	163
Crossties	7x9x8'6", white oak	Ea.	.98	.95	.93	.92	.83	.75	.69	.69	.67	.82	.96	.82	.84	1.05	1.12	1.25	1.25	1.41	1.30	116	155	140
Railroad Scrap (Sold)																								
	No. 1 wrought	N.t.	11.16	11.39	11.96	8.68	7.20	4.20	6.65	7.96	9.07	12.20	13.20	9.90	12.70	14.40	15.64	16.07	16.07	16.07	16.07	102	126	134
	No. 1 heavy melt	N.t.	11.63	11.34	12.82	10.62	7.33	5.34	7.32	8.55	9.29	12.32	14.44	11.70	13.83	15.93	18.60	19.00	19.00	19.00	19.00	103	137	150
	Rails for re-rolling	N.t.	13.80	12.92	14.49	12.55	10.05	7.18	8.10	9.22	9.89	13.21	15.97	14.00	15.95	18.78	20.80	21.00	21.00	21.00	21.00	101	132	145

*Compiled from special reports made by railroads to the *Railway Age*.

Efficiency for Victory

form rules for the application of extras, including the permissible charges for testing and inspection and the circumstances under which they could be applied where the extras were not already outlined in other price regulations. In June and again in September, attention was directed to regulations requiring warehouses to charge railroads and other consumers only mill carload prices for straight carloads of steel out of warehouse stock. This was to prevent circumvention of price ceilings on mill steel, and warehouses were also repeatedly warned that it was a violation of regulations to sell iron and steel in quantities just under the carload weight to obtain the higher prices permitted for l. c. l. shipments. Warehouses were also licensed to insure compliance with maximum price regulations.

Railroad Equipment

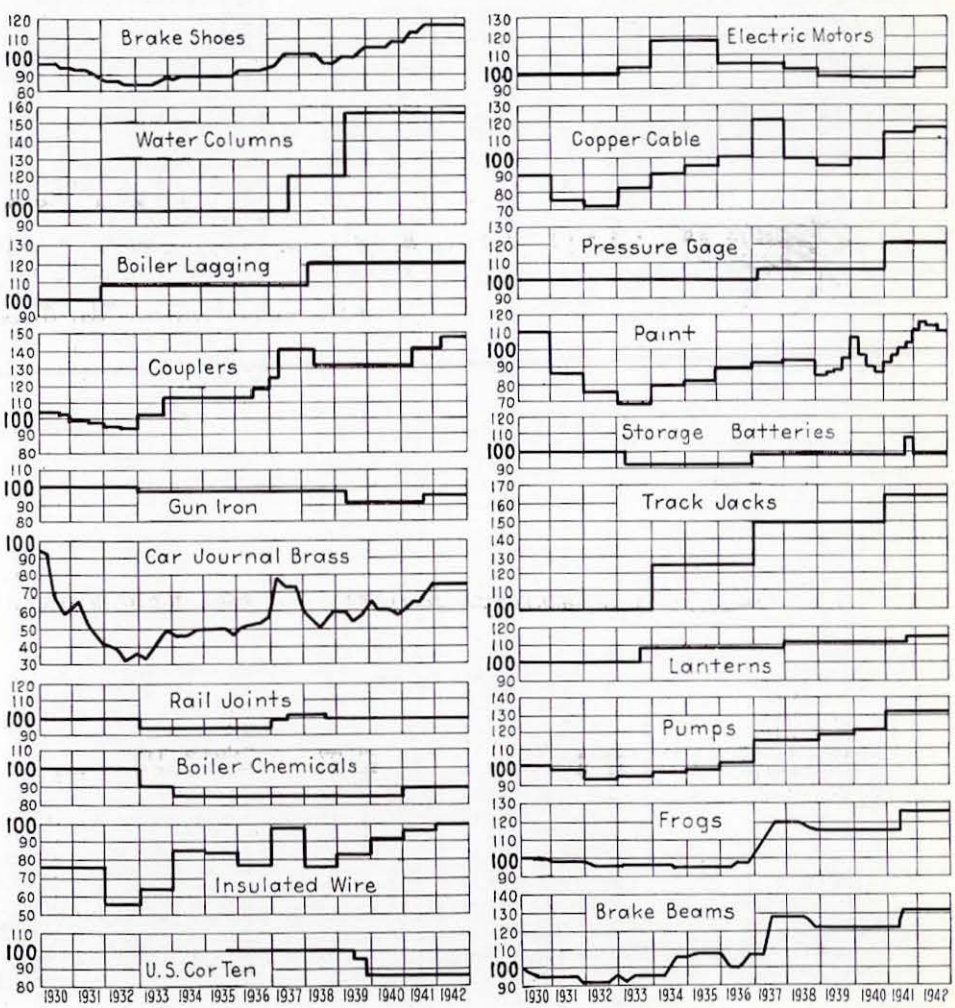
Numerous regulations were issued to control or revise prices of used and surplus railroad equipment, iron and steel scrap and the resale of unused materials. On May 2, railroad cars and locomotives and a wide variety of specialties and machinery and equipment for tracks and signals were covered in Regulation No. 136, effective May 18, which established maximum prices at the levels of October 1, 1941, and permitted dealers to charge only from 55 to 85 per cent of the new cost for used machines. Later, this order was amended to allow March prices for certain machine parts and for machine repairs and rebuilding charges, but required refunds on excessive charges. In September, every dealer in second hand tools was required to register with OPA, and ceiling prices, ranging from 50 to 95 per cent of the original cost, were established to govern the disposition of these materials. Likewise, ceiling prices, ranging from 55 to 85 per cent of the top prices, were established on iron and steel rejects.

In July, a special regulation, No. 174, was set up for the use of railroads and car builders in disposing of car materials which had been rendered useless to them when WPB stopped their equipment building programs. This regulation allowed cost prices plus additions to cover direct expenses and profit margins on useable materials and permitted other immobilized materials to be disposed of at scrap prices.

Adjustments made in relay rail prices assured, in general, that railroads would receive not less than $24 and up to $28 for any relay rail sold, while warehouse prices were revised upward from $32 to $35.84 for 40 to 60-lb. rail and from $32 to $39.20 for 35 to 45-lb. rail.

Scrap prices, while frozen since 1940, were the subject of further regulations in 1942, but for the most part, dealt with minor adjustments in general prices or were adapted to correct local difficulties. One schedule, issued in March, required railroads selling unprepared scrap direct to consumers to charge $3.50 a gross ton instead of $2.50 below the price for prepared scrap. Other schedules created new grades of scrap and permitted the addition of increased transportation costs to delivered prices. Railroad scrap which is reprocessed under conversion agreements with foundries as approved by WPB was excepted from the maximum price regulation.

Before war broke out in Europe, interest in coal



Comparative Trends in Prices of Railroad Appliances. January 1929 taken as 100

centered, on the one hand, in the laws which had been passed to save the coal producers from themselves by putting a floor under coal prices; and, on the other, in the involved administration of the act—first, by the Bituminous Coal Commission, and then by its successor, the Bituminous Coal Division of the Department of the Interior. At present, however, coal prices not only have a floor beneath, but a ceiling over them since OPA decided to take a hand in the coal business.

Last January, after a long investigation of coal production costs which at first held out the promise of a substantial reduction in prices to railroads, the Department of the Interior reversed itself by announcing a basis for minimum costs which averaged 10 cents a ton higher than the previous base, and railroads watched the work of the Bituminous Coal Division in establishing the new minimum prices until the hearings were concluded last June. In the meantime, OPA had also taken an interest in coal and issued a maximum price regulation on railroad and other coal which became effective May 18, and established ceilings, ranging from 25 cents to 60 cents a ton, above the authorized minimum prices on railroad

Average Cost of Fuel Consumed—10 Months 1942

	Coal		Fuel		
	Less Frt. Per Ton Dollars	With Frt. Per Ton Dollars	Oil Per Bbl. Dollars	Gaso. Per Gal. Cents	Diesel Per Gal. Cents
Line Haul Carriers					
Akron, Canton & Young	2.24	3.67	3.14	15.53	6.39
Ala. Great Southern	2.59	2.83	...	19.13	4.89
Alton	2.17	2.38	1.83	7.50	4.72
Ann Arbor	2.09	4.08	2.09	11.47	5.02
Atch. Top. & Santa Fe	2.89	3.08	.97	6.56	4.21
Atlanta & West Point	2.52	3.81	...	...	...
Atlanta, Birm. & Coast	2.53	3.27	...	...	...
Atlantic Coast Line	2.18	3.89	1.63	...	5.74
Baltimore & Ohio	2.12	2.21	1.90	10.09	5.69
Bangor & Aroostook	...	6.12	...	...	...
Bessemer & Lake Erie	2.41	2.64	2.43	14.12	9.50
Boston & Albany	1.99	4.93	3.32	12.61	6.29
Boston & Maine	2.24	4.97	2.53	11.94	6.54
Burlington-Rock Island	...	...	.86	.06	.04
Cambria & Indiana	2.40	...	...	...	...
Canadian National in N. E.	2.05	4.93	4.31	18.03	...
Canadian Pacific in Vt.	2.53	6.28	...	17.39	...
Central of Georgia	2.74	2.93	1.61	9.08	5.43
Central of New Jersey	2.20	4.19	2.73	14.73	6.23
Central Vermont	2.01	5.33	3.20	13.65	6.84
Char. & Western Carol.	2.26	3.90	...	...	...
Chesapeake & Ohio	2.43	2.51	1.93	6.00	...
Chicago & Eastern Ill.	1.93	2.07	1.68	9.48	5.36
Chicago & Ill. Midland	2.27	2.52	2.42	12.57	...
Chicago & North Western	1.49	1.94	.77	9.29	5.36
Chicago, Burl. & Quincy	1.69	1.90	.67	6.76	4.26
Chicago Great Western	1.55	2.41	1.19	7.21	4.64
Chicago, Ind. & Louisville	1.88	2.03	2.22	...	5.33
Chicago, Mil. S. P. & Pac.	2.12	2.43	.94	7.32	4.47
Chicago, R. I. & Pac.	1.85	2.19	.77	10.33	4.18
Chicago, St. P., Minn. & Om.	1.47	4.41	1.46	7.63	4.02
Cin., New Orleans & Tex. Pac.	2.31	2.71	...	...	5.27
Clinchfield	2.28	2.36	2.12	7.39	...
Colorado & Southern	2.93	3.09	.79	7.23	4.64
Colorado & Wyoming	3.14	4.59	...	.14	...
Columbus & Greenville	1.58	3.10	...	7.87	...
Delaware & Hudson	2.27	4.16	2.28	...	...
Delaware, Lack. & Western	2.23	3.72	2.50	...	6.11
Denver & Rio Grande Western	2.24	2.30	2.30	11.78	5.91
Denver & Salt Lake	1.87	1.91	...	8.89	5.23
Detroit & Mackinac	2.25	4.65	1.55	.07	...
Detroit & Toledo Shore	2.10	3.96	3.15	...	...
Detroit, Toledo & Ironton	2.31	3.23	2.05	15.32	5.51
Duluth, Miss. & Iron Range	2.49	4.98	2.94	11.09	...
Duluth, S. S. & Atlantic	...	4.87	...	14.51	...
Duluth, Winnipeg & Pac.	...	4.97	3.27	15.07	...
Elgin, Joliet & Eastern	2.08	2.12	2.07	11.41	5.21
Erie	2.26	2.87	2.25	9.09	6.06
Florida East Coast	...	...	1.47	...	5.47
Fort Worth & Denver City	2.97	4.31	.78	6.35	4.04
Georgia	2.20	4.21	...	20.24	...
Georgia & Florida	2.23	4.35	...	26.11	...
Ga. Southern & Florida	2.31	4.36	...	19.09	5.57
Grand Trunk Western	1.74	3.54	1.85	14.08	6.34
Great Northern	1.52	3.80	.81	7.26	4.37
Green Bay & Western	...	4.68	...	...	5.98
Gulf & Ship Island	1.77	3.83	1.61	14.70	...
Gulf Coast & Subsidiaries	...	...	.84	9.19	3.93
Gulf, Mobile & Ohio	1.88	2.12	...	8.21	4.73
Illinois Central	1.92	2.29	1.63	13.58	4.67
Illinois Terminal	1.96	2.10	1.92	14.50	7.84
International-Great Nor.	...	...	.80	...	3.80
International of Maine	2.35	5.97	...	19.55	...
Kansas City Southern	2.26	2.54	.84	...	4.30
Kansas, Okla. & Gulf	2.65	2.97	1.48	12.89	...
Lake Superior & Ishpeming	...	5.26	...	...	...
Lehigh & Hudson River	1.95	4.73	...	13.87	...
Lehigh & New England	2.17	3.91	2.16	16.72	...
Lehigh Valley	2.08	4.04	2.61	10.69	6.22
Long Island	2.31	4.86	1.73	14.00	5.59
Louisiana & Arkansas	2.30	...	.79	17.80	3.98
Louisville & Nashville	2.09	2.22	1.99	18.03	4.66
Maine Central	2.18	5.91	2.53	13.33	7.16
Midland Valley	2.43	2.60	1.21	12.11	...
Minneapolis & St. Louis	1.84	1.95	1.20	6.94	4.58
Minn., St. P. & S. S. M.	1.57	3.93	1.60	8.37	5.31
Mississippi Central	1.53	3.52	...	13.52	...
Missouri & Arkansas	2.19	2.88	...	7.97	2.17
Missouri-Illinois	1.82	1.89	...	7.09	...
Missouri-Kans.-Tex.	2.44	2.80	.82	6.29	...
Missouri Pacific	1.89	2.00	.79	6.37	3.66
Monongahela	2.00	2.13	3.20	17.90	...
Montour	2.14	2.15	...	...	...
Nashville, Chat. & St. L.	2.25	2.70	1.31	6.62	3.60
Nevada Northern	2.56	5.30	...	2.00	...
New Orleans & N. E.	2.56	3.99	1.57	18.20	4.83
New York Central	2.13	2.44	1.64	12.27	5.83
New York, Chicago & St. L.	2.18	3.77	2.05	...	9.07
New York Connecting	...	...	1.61	...	...
New York, New Haven & Hart.	2.23	4.64	1.73	14.55	6.07
New York, Ont. & Western	2.20	4.14	...	...	8.00
New York, Susq. & Western	2.20	4.82	...	11.90	6.32
Norfolk & Western	2.24	2.30	1.87	7.31	...
Norfolk Southern	2.15	4.06	...	10.95	...
Northern Pacific	1.57	2.07	.92	10.67	5.22
Northwestern Pacific	2.77	...	.88	8.87	5.51
Oklahoma City-Ada-Atoka	...	3.27	1.40	...	...
Pennsylvania	2.19	2.30	2.05	14.40	6.68
Penn.-Reading Seashore	2.16	4.95	1.53	14.71	...
Pere Marquette	2.20	4.27	2.05	10.91	6.42
Pittsburgh & Lake Erie	2.22	2.44	2.50	17.30	...
Pittsburg & Shawmut	2.29	2.34	3.94	15.93	...
Pittsburgh & West Virginia	2.22	2.29	...	...	...
Pitts. Shawmut & Northern	2.35	2.34	...	...	...
Reading	2.11	3.66	2.66	15.08	6.18
Richmond, Fred. & Potomac	2.09	4.63	...	10.87	5.86
Rutland	2.16	5.02	2.62	...	...
St. Louis-San Francisco	2.21	2.38	.84	11.34	4.29
St. Louis-San Francisco & Tex.	...	...	.86	11.43	...
St. Louis Southwestern	1.98	2.89	.85	6.75	3.79
Seaboard Air Line	2.28	3.54	1.57	16.24	5.97
Southern	2.21	2.31	1.79	21.03	5.04
Southern Pac.-Pac. Sys.	3.13	3.56	1.02	12.39	4.42
Spokane International	2.80	3.95	...	...	...
Spokane, Port. & Seattle	4.66	6.32	.88	14.32	4.21
Staten Isl. Rapid Transit	2.38	4.91	...	...	...
Tennessee Central	1.97	2.15	2.68	...	6.47
Texas & New Orleans	3.82	...	.82	8.26	3.86
Texas & Pacific	...	...	.82	...	...
Texas Mexican	...	...	1.24	...	3.26
Toledo, Peoria & Western	1.65	1.84	3.04	12.47	8.00
Union Pacific	2.07	2.22	1.35	9.09	4.24
Utah	1.94	2.09	2.63	17.33	...
Virginian	2.08	2.52	...	...	...
Wabash	2.02	2.41	1.90	8.58	4.85
Western Maryland	2.30	2.50	2.57	15.22	8.00
Western Pacific	2.33	3.62	.82	11.47	5.20
Wheeling & Lake Erie	2.24	2.36	2.21	13.32	5.46
Switching and Terminal Companies					
Aliquippa & Southern	...	3.12	...	...	...
Alton & Southern	1.76	2.66	...	...	...
Baltimore & Ohio C. T.	2.19	4.02	...	...	5.32
Belt of Chicago	1.68	3.12	3.98	.13	.05
Birmingham Southern	...	...	...	...	3.77
Brooklyn Eastern	...	...	1.60	...	...
Chicago & Western Indiana	1.57	3.31	2.09	.14	...
Chicago River & Indiana	1.67	3.41	...	...	5.22
Cincinnati Union Terminal	2.07	4.03	...	...	...
Conemaugh & Black Lick	2.72	2.72	...	...	...
Detroit Terminal	2.04	4.29	...	16.02	...
Houston Belt & Terminal	...	...	.85	...	.04
Indiana Harbor Belt	1.80	3.45	2.09	...	...
Indianapolis Union	1.89	3.16	2.44	...	...
Kansas City Terminal	1.85	3.80	1.01	...	.05
Kentucky & Indiana Terminal	1.87	3.26	...	...	.05
Lake Erie & Eastern	...	3.98	...	...	...
Lake Terminal	2.31	3.87	...	15.53	...
Minnesota Transfer	...	5.91	...	...	6.76
Monongahela Connecting	...	4.09	...	...	7.03
New Orleans Terminal	2.55	5.04	...	...	4.05
Newburgh & South Shore	2.22	3.80	...	11.96	6.26
Northern Pac. Term. of Ore	...	...	.99	...	.05
Ogden Union	2.33	4.38	.84	16.89	...
Peoria & Pekin Union	1.86	2.52	3.12	15.96	4.93
Portland Terminal	2.14	5.77	2.92	14.74	6.25
St. Paul Union Depot	...	6.54	...	9.27	6.44
Terminal of St. Louis	2.57	3.26	3.21	...	.05
Tex. Pac.-Mo. P. Term. of N. O.	2.05	...	.88	.18	.04
Toledo Terminal	...	4.09	...	...	...
Union of Penna.	2.71	2.77	3.18	...	7.15
Washington Terminal	2.31	4.94	...	...	...

* As reported to I. C. C.

coal as they had been established by the Bituminous Coal Division.

Coal Is King Again

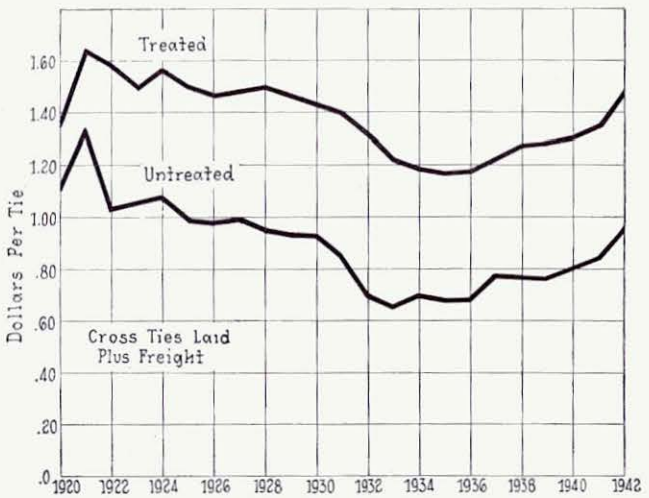
During all this time and in succeeding months, coal was again king from the standpoint of the demand for it—a demand which was intensified by the effort of railways and industries, with the encouragement of the government, to store coal to prevent a shortage of coal and cars. The 90,000,000 tons of coal in storage on November 1 was the largest stock pile in the history of the country; and bituminous coal production last year, including that coal, reached approximately 573,000,000 tons, which was about 15 per cent more than in 1942.

Recently, the government tried to increase the coal week from 35 hours to 42 hours, but wage contracts called for time and a half for the sixth day, and up to the present, OPA has declined to increase maximum prices to include the extra cost and this development has therefore not yet materialized. As matters stand, maximum prices remain at levels substantially higher than the prices which prevailed between October 1 and October 15, 1941. The railroads succeeded in getting OPA to establish separate prices for railroad fuel, which are expressed in terms of the minimum prices plus a specific number of cents per ton. Further relief was obtained by the carriers in an amendment to the minimum prices regulations, allowing producers of bituminous coal to sell domestic coal to railroads, for use other than on locomotives, at run-of-mine prices at times when producers desire to dispose of excess quantities of these grades. Many railroads have managed to avoid the maximum prices on their coal, but they are now generally paying prices above the new minimum costs determined last spring and, of course, are confronted with the added costs of unloading and reloading storage coal.

The fuel oil picture has been somewhat confused by rationing, which has been dictated by difficulties in distributing the oil and by action taken to conserve rubber tires. Fuel oil has nevertheless become a scarce item, even for railroads in oil producing territories, thus reversing the condition of recent years when production had to be severely and arbitrarily curtailed to stabilize prices. Consumption of fuel oil in 1942 was about 31 per cent greater than in 1941, with the railroads using over 90,000,000 bbl. last year, or about 12 per cent more than in 1941, and they have had to be alert to obtain enough fuel to keep locomotives operating at full efficiency.

Maximum Price Regulation No. 88, as originally issued, established prices on petroleum fuels at the lowest levels in October, 1941, but this regulation was repeatedly revised in one particular or another last year as new situations arose to plague producers, refiners and consumers. In March, oil companies in Eastern states were permitted to charge a half cent more a gallon for gasoline, 0.04 cent more for kerosene and 20 cents a bbl. more for heavy oils to cover higher costs of transportation, following a 0.3 cent a gal. increase in gasoline allowed in January. The government is subsidizing part of the increased cost of transportation. In November, 6.75 cents a gal, was allowed for tank lots of kerosene in Florida, as compared to 5.25 cents in October, 1941; and in November, OPA allowed refineries in the Texas Panhandle district to raise their prices of fuel oil to railroads from 69 cents to 74 cents a bbl. Gasoline rationing, effective over the entire country on November 21, and also the rationing of oil for heating reduces the over-all demand for oil, but only for civilian uses and is not expected to reduce prevailing price levels.

A further increase of three-tenths per gallon in fuel oil was authorized December 26.



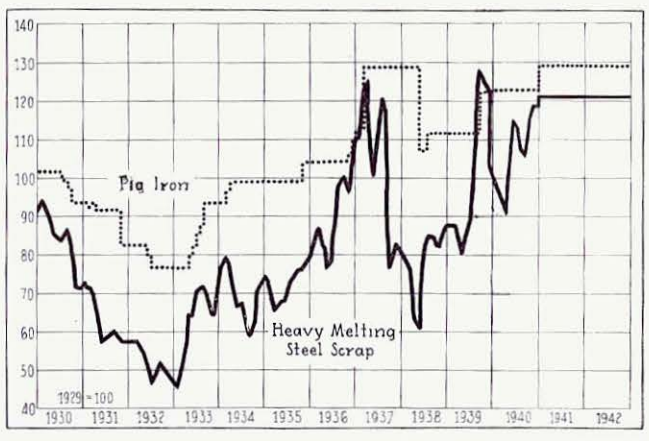
Average Cost of Cross Ties laid in Replacement

Average Cost of Cross Ties Laid in Replacement—Class I Railroads

Dollars Per Tie

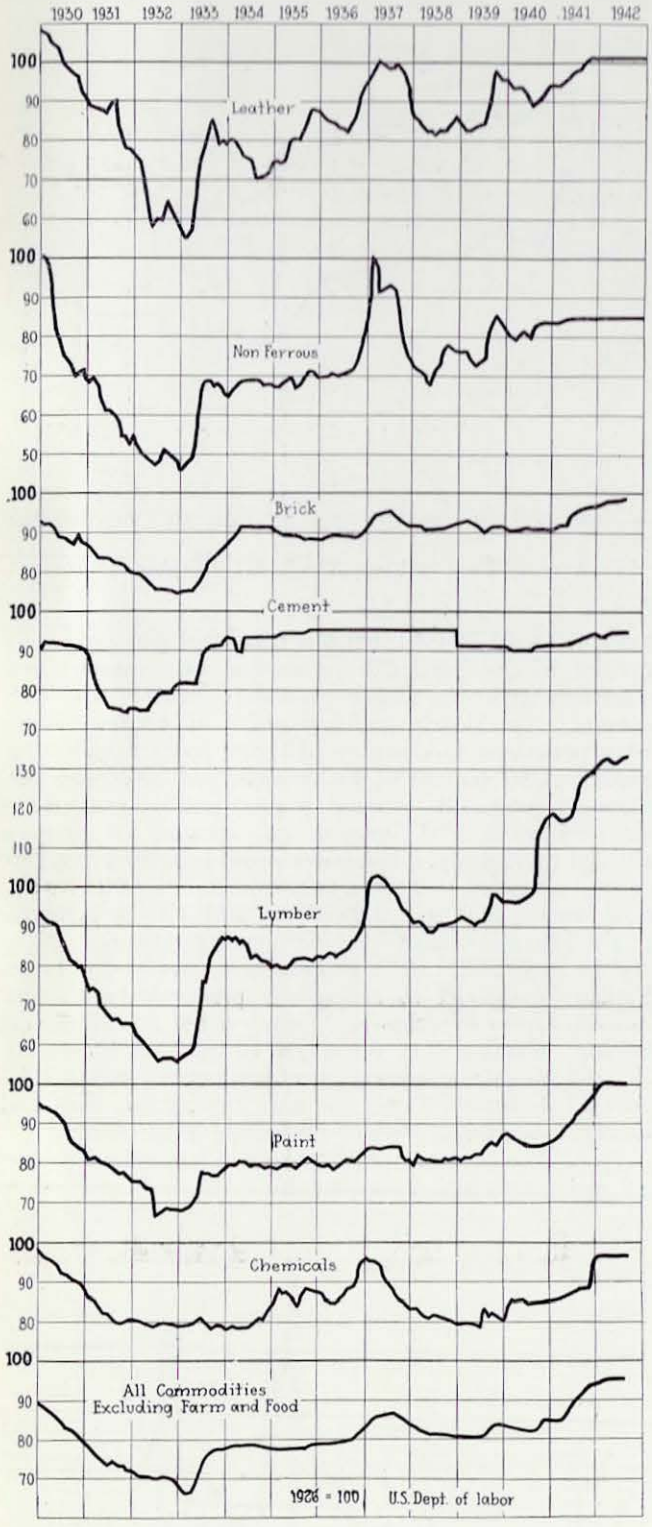
	Untreated				Treated			
	United States	East-ern Dist.	South-ern Dist.	West-ern Dist.	United States	East-ern Dist.	South-ern Dist.	West-ern Dist.
1920	1.20	1.36	1.29	.93	1.35	1.48	1.34	1.26
1921	1.34	1.76	1.21	1.08	1.64	2.10	1.55	1.39
1922	1.03	1.46	.87	.88	1.58	1.99	1.42	1.33
1923	1.05	1.38	1.02	.90	1.49	1.87	1.23	1.26
1924	1.07	1.58	1.07	.91	1.56	1.91	1.44	1.35
1925	.99	1.25	1.02	.85	1.49	1.92	1.39	1.29
1926	.98	1.23	1.04	.81	1.46	1.83	1.37	1.25
1927	.99	1.26	1.04	.82	1.48	1.89	1.40	1.28
1928	.95	1.21	.97	.83	1.49	1.89	1.44	1.29
1929	.93	1.13	.97	.81	1.46	1.88	1.35	1.27
1930	.92	1.12	.95	.82	1.43	1.81	1.34	1.26
1931	.84	1.00	.87	.77	1.39	1.76	1.30	1.25
1932	.70	.92	.70	.66	1.32	1.66	1.24	1.18
1933	.65	1.03	.63	.57	1.22	1.56	1.09	1.09
1934	.69	.77	.77	.57	1.18	1.50	1.07	1.06
1935	.68	.77	.72	.60	1.17	1.45	1.06	1.07
1936	.68	.72	.76	.59	1.18	1.42	1.10	1.08
1937	.77	.80	.87	.67	1.22	1.50	1.17	1.10
1938	.76	.75	.89	.65	1.27	1.54	1.26	1.16
1939	.75	.77	.86	.66	1.28	1.52	1.29	1.16
1940	.79	.75	.90	.68	1.29	1.54	1.29	1.16
1941	.82	.82	.95	.71	1.31	1.55	1.32	1.18
1942*	.95	.97	1.17	.85	1.48	1.75	1.52	1.30

Source I. C. C. Excludes labor. * Ties purchased 9 Mos.



Comparative Price Trends in Basic Metals—1930 to 1942

The extreme difficulty facing the railroads in getting forest products for ordinary maintenance is in striking contrast to the plentiful supply of lumber which WPB believed was available when it proposed the substitution of wood for steel in building freight cars; and this problem of production created, on the one hand, by



Trend in Wholesale Prices—January 1926 taken as 100

orders for war work beyond the stretch of anyone's imagination a few years ago and accentuated by a scarcity of labor, has severely complicated OPA's problem in regulating prices. At this time, all lumber is covered by maximum price regulations which extend to small lumber yards as well as mills, involved amendments and revisions of price schedules being frequently made all last year.

Prices of Alaska lumber were frozen at the March levels, only to be excepted from any price regulation on June 10. The Douglas fir plywood order was amended September 16 and again in December to raise previous ceilings. Regulations covering Southern pine prices were amended April 16 to halt evasions,—then followed amendments in July and others in October and November. Retailers were licensed on September 11. Contracts for delivery of West Coast lumber were removed from the provisions of the General Maximum Price Regulation in July and placed under a special regulation, which was amended on July 6 to raise the ceiling on certain structural grades and was again amended on September 15 to embrace other items. A schedule, issued in February on Western pine, was repeatedly amended to raise prices and allow extras. The schedules on Southern hardwoods were amended several times and so were regulations over Appalachian hardwoods, Northeastern softwoods and Northern hardwoods. While these regulations all undertook to maintain prices at the levels in October, 1941, the pressure to increase cost in one form or another has continued and this pressure has been increased by the exceptions made in favor of some buyers, including rulings which permit contractors to pay premiums to small mills in the way of extras for certain grades in Schedule No. 26 and to add 10 per cent to prices covered in Regulation No. 216.

Cross Ties Advance

The railroads as a whole have been sympathetic with OPA in its struggle to control the upward tendency of prices, but in the case of ties, the railroads have been compelled to appeal for upward adjustments in regulations covering cross ties costs to stimulate production and, in some territories, to meet the competition they have faced from government buying which has not been bound by the price controls, particularly as outlined above. On September 5 maximum prices were adjusted on the basis of the buyer's prices instead of the seller's prices and, in general, permitted payment of prices at the highest levels at which railroads bought ties from January 1, 1942, to March 31, and also permitted refunds and other adjustments in payments which have been made for ties when authorized by OPA. These regulations required all railroads to report their tie purchases and prices but left the way open for applications for further relief from prices which are too low to promote tie production, and on December 21, OPA established specific maximum dollars-and-cents prices on all cross ties produced in Eastern United States which authorized railroads to pay approximately 10 per cent more for ties than in March.

The lumber and tie situation has been, and still is, acute for the railroads in every direction. In Southern territory, previous to Order M-208, controlling the distribution of softwood, the government was buying all available lumber for defense projects, paying very high prices and, in addition, applying high priority ratings to obtain deliveries; while under Order M-208, the railroads have not been permitted, without special authorization which many of them have been unsuccessful in obtaining, to purchase the quality of lumber and timbers needed to maintain their standards. Government competition thus at first precluded the railroads

(*Continued on page 106*)

Materials for Roads Decline in '42

Flow of supplies decreases while war traffic increases—Current deliveries less than in 1941 and below current consumption

By D. A. Steel

Purchases and Stores Editor

THE railroads appear, at this time, to have received slightly more materials and supplies, other than equipment, in 1942 than in 1941, but less materials and supplies if equipment is included. Materials received during the last six months, moreover, totaled less than in either the first six months of 1942 or the last six months of 1941, and less material was received since last June than was consumed.

$821,000,000 of Material

Subject to revision with more complete information for November and December, the Class I railroads obtained approximately $821,288,000 of materials and supplies and $405,523,000 of fuel last year—a total of $1,226,811,000 of materials and fuel. This was exclusive of materials for the construction of cars and locomotives in contract shops, and also does not include materials for switching and terminal companies, the short lines, the Pullman Company and private car lines.

The Pullman Company received $13,161,000 of materials and supplies for maintaining its equipment on the railroads last year, while 19 private car lines, including the Fruit Growers Express, the Pacific Fruit Express, the Western Fruit Express, the Armour Car Lines, the Merchants Despatch, the North American Car Corporation and the Wilson Car Lines, but excluding General American Transportation, received about $35,000,000 of materials and supplies, which included some materials for building cars which were later immobilized by government freeze orders. Switching and terminal companies and short lines, which do not include their purchases with the Class I line-haul railroads, are estimated

Materials Received by Purchase—Class I Railroads*

	Fuel (000)	Rail (000)	Cross Ties (000)	Other Material (000)	Total (000)	Total Less Fuel (000)
1929	$336,805	$88,735	$143,874	$759,186	$1,328,600	$991,795
1930	308,277	60,980	127,652	538,591	1,035,500	727,223
1931	244,500	41,500	44,000	365,000	695,000	450,500
1932	178,250	15,500	27,550	223,700	445,000	266,750
1933	179,150	10,650	19,750	248,200	457,750	278,600
1934	220,000	33,200	39,700	332,100	625,000	405,000
1935	232,400	20,354	33,780	306,593	593,127	360,727
1936	271,398	37,237	41,360	452,309	802,304	530,906
1937	293,540	44,935	58,361	562,100	958,936	665,396
1938	243,889	23,920	37,911	277,091	582,811	338,922
1939	257,880	38,340	39,760	434,394	770,374	512,494
1940	273,677	45,418	47,995	488,883	855,973	582,296
1941	349,848	52,311	50,039	710,831	1,163,029	813,181
1942	405,523	50,931	67,801	702,556	1,226,811	821,288

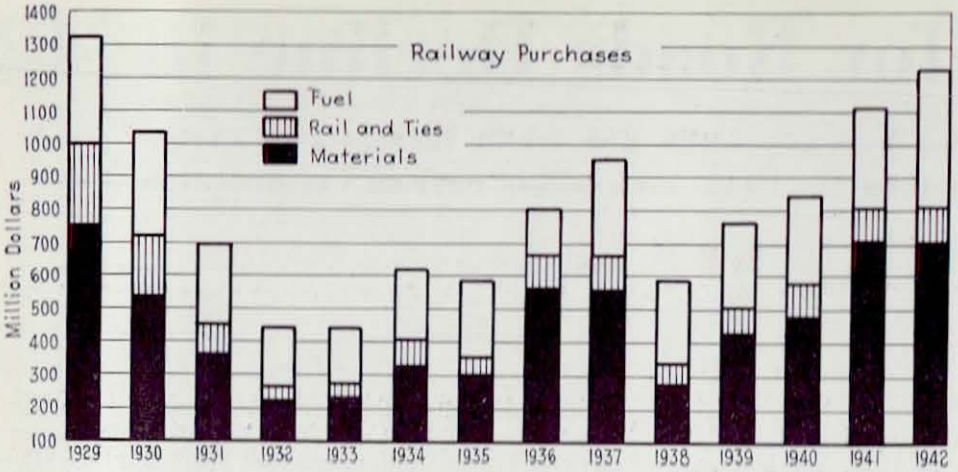
* Compiled from reports received from railroads by *Railway Age*—partially estimated and subject to revision.

Railway Purchases—Materials and Supplies

	Fuel (000)				Rail (000)				Cross Ties (000)			
	1939	1940	1941	1942*	1939	1940	1941	1942*	1939	1940	1941	1942*
Jan.	$23,377	$24,977	$27,261	$31,908	$483	$3,529	$3,464	$3,523	$2,445	$4,128	$3,472	$5,054
Feb.	23,063	24,219	27,901	31,060	2,934	4,815	5,297	4,132	2,632	3,928	3,514	4,995
Mar.	24,361	21,880	31,121	33,067	4,631	6,043	5,168	4,094	3,660	4,634	4,087	6,330
Apr.	17,833	21,575	19,203	34,255	5,370	6,470	4,857	5,785	3,297	4,585	4,365	6,374
May	16,925	21,852	25,550	34,233	6,569	5,019	6,196	5,449	3,697	4,789	4,369	6,389
June	17,783	20,160	27,338	34,315	5,893	5,022	4,868	5,787	3,742	4,645	4,071	6,369
July	19,502	20,875	29,700	33,943	2,293	4,571	4,697	5,508	3,157	4,293	4,192	5,869
Aug.	20,446	22,128	30,535	34,233	2,761	2,325	3,880	4,770	3,780	3,898	4,345	5,909
Sept.	21,292	21,575	31,605	35,195	2,000	1,856	5,511	3,496	3,357	3,382	4,396	5,311
Oct.	24,381	23,104	34,343	33,814	2,436	2,574	2,965	2,987	3,221	3,487	4,398	5,201
Nov.	24,254	24,145	31,062	34,500	1,778	2,094	3,189	3,200	2,967	3,116	4,115	5,000
Dec.	24,663	27,187	34,229	35,000	1,192	1,100	2,219	2,200	3,805	3,110	4,715	5,000
12 Mos.	$257,880	$273,677	$349,848	$405,523	$38,340	$45,418	$52,311	$50,931	$39,760	$47,995	$50,039	$67,801

	Other Material (000)				Total (000)				Total Less Fuel (000)			
	1939	1940	1941	1942*	1939	1940	1941	1942*	1939	1940	1941	1942*
Jan.	$27,374	$45,593	$45,457	$67,506	$53,679	$78,227	$79,654	$107,991	$30,302	$53,250	$52,393	$76,083
Feb.	26,721	39,939	43,467	61,751	55,350	72,901	80,179	101,938	32,287	48,682	52,278	70,878
Mar.	33,467	42,655	54,070	69,585	66,119	75,212	94,446	113,076	41,758	53,332	63,325	80,009
Apr.	33,842	39,407	55,444	64,964	60,342	72,037	83,869	111,378	42,509	50,462	64,666	77,123
May	35,651	37,122	59,492	61,920	62,842	68,782	95,607	107,991	45,917	46,930	70,057	73,758
June	33,956	34,510	59,682	58,474	61,374	64,337	95,959	104,945	43,591	44,177	68,621	70,630
July	33,749	39,446	61,117	53,247	58,701	69,185	99,706	98,567	39,199	48,310	70,006	64,624
Aug.	34,740	42,016	64,371	53,434	61,727	70,367	103,131	98,346	41,281	48,239	72,596	64,113
Sept.	35,410	40,776	65,714	52,947	62,059	67,589	107,226	96,949	40,767	46,014	75,621	61,754
Oct.	45,407	43,630	70,249	56,228	75,445	72,795	111,955	98,230	51,064	49,691	77,612	64,416
Nov.	44,918	39,620	62,058	52,500	73,917	68,975	100,424	95,200	49,663	44,830	69,362	60,700
Dec.	49,159	44,169	69,710	50,000	78,819	75,566	110,873	92,200	54,156	48,379	76,644	57,200
12 Mos.	$434,394	$488,883	$710,831	$702,556	$770,374	$855,973	$1,163,029	$1,226,811	$512,494	$582,296	$813,181	$821,288

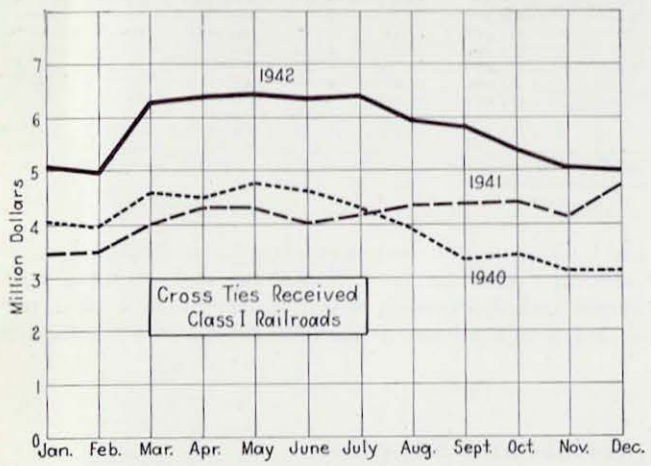
* Subject to revision.



Annual Railway Purchases, Exclusive of New Equipment, 1929 to 1942

to have received about $40,000,000 of materials and fuel.

Deliveries of materials, exclusive of fuel and new equipment, in 1942 reflected an increase of approximately $238,992,000, or 41 per cent, over the corresponding receipts in 1940, and exceeded the corresponding deliveries in any year since 1929, but totaled only about



Trend of Cross Tie Purchases by Railroads, January, 1940, to November, 1942

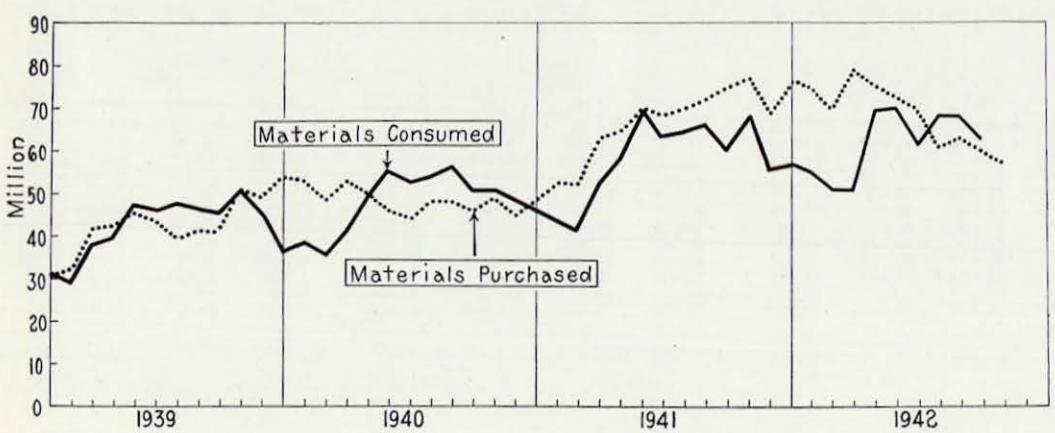
$8,107,000 more than in 1941. This increase would be more than offset by adjustments to exclude the effect of slightly higher prices paid for materials last year. Expenditures for fuel, including coal bought for storage, exceeded those in 1941 by $55,675,000, or 16 per cent, according to present information, and exceeded fuel purchases in 1940 by approximately $131,846,000, or 48 per cent; they were larger than the aggregate purchases of fuel in 1929.

The railroads are understood to have received all of

Materials in Stock—Class I Railroads

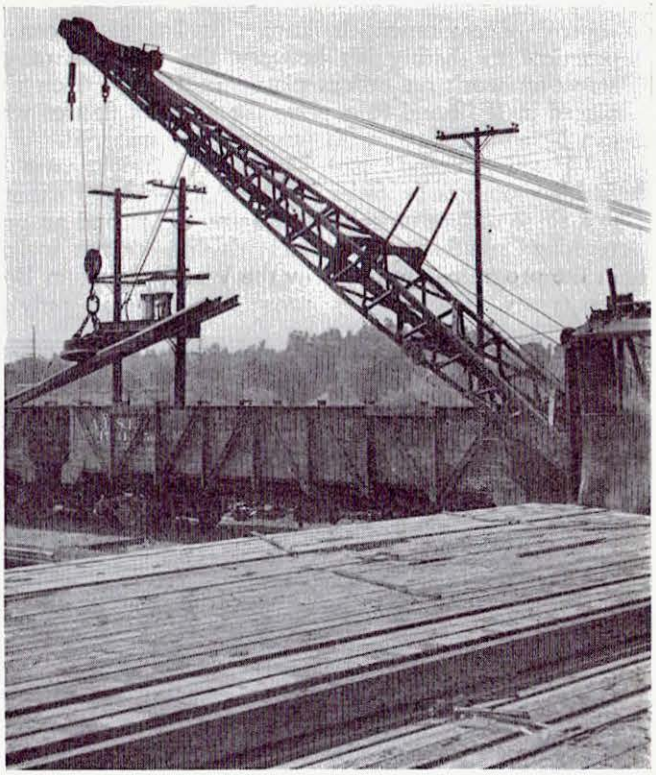
	Fuel (000)	Rail—New and S. H. (000)	Cross ties (000)	Stores Stock (000)	Scrap (000)	Total (000)
			Year 1940			
Jan. 1	$21,778	$25,552	$51,359	$216,996	$11,551	$327,236
Feb. 1	22,454	28,213	58,187	222,127	11,862	342,843
Mar. 1	23,190	31,546	60,615	230,045	11,576	356,972
Apr. 1	21,016	34,388	64,466	234,899	11,509	366,278
May 1	21,343	35,826	63,945	234,866	11,551	367,531
June 1	22,419	34,818	60,070	231,308	11,275	359,890
July 1	22,310	35,138	57,452	225,066	11,371	351,337
Aug. 1	24,065	34,134	55,988	222,001	11,326	347,514
Sept. 1	25,513	31,927	54,531	217,948	11,041	340,960
Oct. 1	25,442	30,055	53,517	216,201	10,848	336,063
Nov. 1	22,272	27,457	50,374	221,444	9,711	331,258
Dec. 1	24,414	27,674	54,464	213,555	9,602	329,709
			Year 1941			
Jan. 1	24,002	25,985	50,967	223,673	9,818	334,445
Feb. 1	24,591	26,600	60,311	220,887	10,728	343,117
Mar. 1	27,105	28,217	62,455	228,012	10,859	356,648
Apr. 1	30,984	28,573	65,356	235,404	11,102	371,419
May 1	23,486	25,649	58,349	251,691	9,632	368,807
June 1	24,578	26,461	57,051	252,972	10,357	371,419
July 1	25,991	24,389	51,551	266,019	9,669	377,619
Aug. 1	29,299	25,156	55,976	265,886	10,264	386,581
Sept. 1	32,632	24,500	51,745	276,661	10,380	395,918
Oct. 1	34,035	25,755	44,327	298,149	9,704	411,970
Nov. 1	37,455	24,009	44,452	309,295	9,377	424,588
Dec. 1	37,668	23,979	46,632	320,572	8,181	437,032
			Year 1942*			
Jan. 1	40,040	23,986	48,426	338,839	8,808	460,099
Feb. 1	40,427	22,705	60,944	346,458	10,941	481,475
Mar. 1	40,198	23,886	64,290	360,946	10,489	499,809
Apr. 1	41,372	23,635	66,837	377,799	9,947	519,590
May 1	43,821	22,924	65,552	386,375	10,168	528,840
June 1	44,574	23,562	62,424	392,441	10,689	533,690
July 1	48,408	22,941	58,835	393,419	10,816	534,419
Aug. 1	50,580	21,847	58,520	394,600	9,366	534,913
Sept. 1	50,434	21,622	55,800	392,513	9,609	529,978
Oct. 1	51,624	20,484	54,562	386,346	9,544	522,560
Nov. 1	51,880	17,929	45,807	389,259	10,865	515,740

* Subject to revision.



Comparative Trends in Materials Delivered and Consumed, 1939 to 1942

the 1,260,000 net tons of rail in the program authorized by the War Production Board last year, and they received approximately $67,801,000 of cross ties. This was 35 per cent more than was spent in 1941 for ties, and 41 per cent more than was spent in 1940; but the actual increase in the number of ties delivered to the railroads last year is somewhat less than these figures indicate, after making adjustments for the higher average prices paid for ties last year.



Loading Scrap Rail on the Santa Fe

Railway Purchases

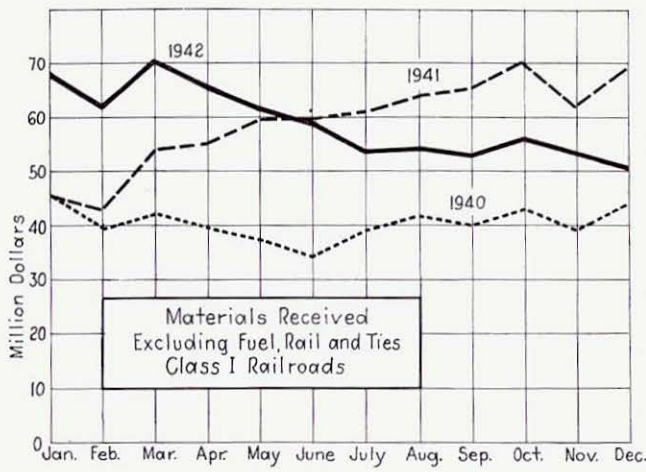
Road	Materials Received—10 Months (Includes Rail and Ties—Excludes Fuel) 1942	Per Cent of Operating Revenue	1941	Per Cent Increase#	Materials (Ex. Rail and Ties) Aug.-Sept.-Oct. 1942	Per Cent Increase# from 1941
A. C. & Y.	$ 393,512	13.9	$ 369,442	6	$ 99,269	— 7
Alton	4,431,285	17.5	3,073,055	44	1,028,009	17
Alton & Sou.	240,431	....	270,444	—11	47,272	—31
Ann Arbor	427,415	10.0	474,455	—10	113,076	—30
A. T. & S. F.	26,069,762	9.0	33,010,815	—24	6,119,467	—42
A. B. & C.	575,987	11.8	489,367	17	105,887	—28
A. C. L.	12,164,695	13.4	8,709,760	39	2,470,801	— 8
B. & O.*	27,002,990	12.2	22,497,004	20	.....	..
Bang. & Arros.	699,789	30.0	557,080	25	121,836	15
Bing. & Gar.	402,380	....	114,284	250	131,620	7T
B. & Me.	6,542,482	10.1	5,927,585	10	.....	..
Burl.-Rock Isl.*	57,487	4.5	28,336	100	.....	..
Cambria & Ind.	107,525	6.1	155,720	—31	19,498	—43
Cent. of Ga.	2,375,096	10.0	2,930,265	—19	481,014	—28
Cent. of N. J.	5,783,976	12.2	5,399,435	7	1,374,655	—12
Cent. Vt.	692,446	10.1	690,184	1	120,044	—41
Char. & W. C.	535,225	16.4	499,197	7	87,357	—26
C. & O.	11,842,543	7.9	.....	..	.....	..
C. & E. I.	2,359,119	12.1	2,323,774	1	506,314	—19
C. & I. M.	679,205	13.3	736,071	— 8	100,039	—46
C. & N. W.*	12,751,776	12.7	12,545,458	1	.....	..
C. B. & Q.	18,445,644	13.9	15,215,287	20	4,724,004	7
C. I. & L.*	833,386	9.9	1,120,571	—25	.....	..
C. R. I. & P.	13,608,695	12.3	11,771,006	15	3,501,058	12
C. St. P. M. & O.*	2,216,160	13.0	2,290,131	— 8	.....	..
Colo. & Sou.	1,111,658	13.1	1,000,918	11	286,263	4
C. & G.	298,742	25.2	171,604	74	61,183	— 3
D. & H.	4,786,534	12.5	3,967,540	21	1,043,787	—12
D. L. & W.*	5,288,353	9.9	5,267,818	1	.....	..
Det. & Mack.	105,554	11.0	81,430	30	26,739	120
D. T. & S. L.	219,707	6.3	198,843	11	31,508	—32
D. T. & I.	609,217	8.8	533,010	11	100,091	—42
D. M. & I. R.	2,237,186	5.7	2,068,434	7	404,490	—22
D. S. S. & A.*	338,146	10.5	393,510	—13	.....	..
E. J. & E.	2,074,695	7.4	2,088,415	— 1	459,593	—13
Erie	10,271,424	10.2	10,909,626	— 6	2,228,674	—34
F. E. C.	2,305,567	14.2	1,212,414	90	416,486	60
Ft. W. & D. C.	1,186,833	13.5	890,835	33	273,529	14
Gt. Nor.	18,137,817	13.5	17,370,443	5	3,539,634	—25
Gulf, Mob. & O.	3,462,759	12.8	2,265,523	53	508,755	— 5
I. C.	26,359,068	15.0	23,710,226	11	7,115,005	—13
Ill. Term.	1,053,621	14.3	863,794	21	255,944	7
K. C. Term.	602,608	....	646,789	— 7	172,374	—19
L. S. & I.	130,416	4.1	199,546	—35	27,088	—36
L. & H. R.	256,582	8.9	201,015	27	47,949	—26
L. & N. E.	343,603	6.6	395,609	—12	76,444	—53
Lehigh Val.	5,224,858	8.2	4,130,198	24	1,515,110	39
La. & Ark.	1,514,708	12.0	1,441,988	4	410,359	16
L. & N.	12,643,090	9.2	13,906,344	— 9	2,851,796	—26
Me. Cent.	1,835,136	13.7	1,714,084	7	.....	..
M.St.P.&S.S.M.*	4,409,102	14.1	3,988,597	11	.....	..
Miss. Cent.*	147,445	12.6	130,928	12	.....	..
Mo. & Ark.	131,801	10.7	152,205	—13	.....	..
M-K-T.	6,974,741	15.3	3,321,758	110	2,316,845	83
Mo. Pac.*	19,622,191	11.0	17,839,345	10	.....	..
Monongahela	325,800	5.5	301,385	8	42,777	—48
Montour	192,398	8.4	214,609	—10	39,320	—40
N. C. & St. L.	2,828,966	11.7	2,329,144	21	640,161	2
Nev. Nor.	129,571	21.8	219,314	—41	20,528	—49
N. Y. C.	63,537,792	12.3	62,277,865	2	.....	..
N. Y. C. & St. L.	5,603,297	7.8	.....	..	.....	..
N. Y. N. H. & H.	12,539,672	9.7	10,586,305	19	3,184,492	3
N. Y. O. & W.	835,725	13.2	485,633	72	254,159	75
Nor. Pac.	14,095,862	14.7	11,249,253	25	2,802,384	— 8
Northwest Pac.*	172,476	4.9	100,213	70	.....	..
Penna.-Long Is.	73,091,547	10.1	82,424,562	—11	17,046,932	—45
Pa.-R. S. L.	519,476	6.5	527,863	— 1	63,250	—44
Pere Mar.	3,825,487	10.6	.....	..	.....	..
Pitt., Shaw. & Nor.	132,315	10.6	194,202	—32	36,997	—52
Reading	11,464,277	13.6	9,725,770	18	2,286,494	—20
R. F. & P.	1,883,365	8.4	1,510,201	24	512,676	3
Rutland	378,064	10.6	387,314	— 2	73,577	—40
St. L.-S. F.	7,199,653	10.1	8,525,330	—15	2,066,090	— 8
St. L.-S. W.*	4,424,876	13.0	4,035,591	9	.....	..
Southern	22,835,510	10.4	22,688,094	1	5,718,222	6
S. P.-Pac. Lines*	24,663,819	9.6	18,398,272	34	.....	..
S. P. & S.*	1,957,309	14.2	1,653,916	18	.....	..
Tenn. Cent.	713,313	21.5	441,349	61	123,270	10
Term. of St. L.	1,968,109	....	1,658,763	19	742,711	—15
T. & N. O.	7,052,982	8.8	5,604,709	25	1,877,985	10
Tex. & Pac.	7,305,872	18.0	4,982,769	47	1,739,631	53
U. P. Sys.	42,718,587	15.5	36,030,023	19	8,996,355	—22
Utah	72,568	6.5	64,781	13	13,860	—19
Virginian	4,841,628	21.6	2,705,853	78	1,160,223	57
Wabash*	7,464,446	13.3	6,338,509	18	.....	..
West. Md.*	3,225,489	14.4	4,117,574	—21	.....	..
West. Pac.*	3,372,593	13.0	2,303,400	46	.....	..
W. & L. E.	2,239,050	11.1	2,868,700	—22	478,316	—29

*Nine months. #Minus sign indicates decrease.

Less Maintenance Material

Other materials received amounted to $702,556,000, which was 44 per cent more than the amount received by purchase in 1940 and within 7 per cent of the corresponding total in 1929; but the total was $8,275,000 less than in 1941, without deducting for the higher material costs in 1942.

The usual equipment figures are omitted from this review because of incomplete information about the status of orders that were placed in 1941 and 1942, and because orders for new equipment have not been satisfactory indicators of current purchasing for railway transportation since the War Production Board took



Month to Month Trend of Materials Received by Railroads in 1942 Compared to Deliveries in 1940 and 1941

control of equipment building. It has also been impractical to distinguish between the progress of construction work on orders placed in 1941 and on those placed in 1942 and to express the work in figures which can be co-ordinated with purchases of material.

Class I railroads had 74,898 new freight cars and 546 locomotives on order in January, 1942, for example, and these orders included refrigerator cars and an undetermined number of box cars which were not included in the programs approved by the War Production Board last year. These latter programs provided only for 63,000 freight cars in 1942, which was less than the number on order on January 1. Again, the 1,226 locomotives to be built were 680 less than the number on order on January 1. Up to November 1, moreover, the railroads had received only 638 locomotives, or only 82 more than the number on order on January 1, without considering new orders placed last year. As an alternative for the value of orders placed with manufacturers for new equipment, it can be stated roughly that the railroads installed about $325,000,000 of new cars and locomotives last year (including equipment build in rail-

Materials on Hand October 31, 1942

	Rail		Cross Ties		Other Material	
	1942	1941	1942	1941	1942	1941
A. C. & Y.	$1,538	$5,789	$40,563	$14,831	$165,267	$143,007
Alton	23,350	147,109	242,369	78,448	1,196,833	726,520
Alton & Sou.	46,553	33,396	12,405	9,243	115,770	99,721
Ann Arbor	111	83	8,336	11,165	216,713	201,726
A. T. & S. F.	1,329,866	1,298,407	5,616,995	6,821,820	17,729,208	16,288,657
A. B. & C.	12,298	.....	45,206	.....	249,670	.....
A. C. L.	58,416	192,500	405,135	332,090	5,472,900	3,564,819
B. & O.	362,742*	546,755	933,131*	1,088,029	13,425,819*	9,439,069
Bang. & Aroo.	66,560	54,760	65,290	83,923	661,703	624,691
Bing. & Gar.	22,390	6,484	23,038	14,863	54,609	38,158
B. & M.	56,869	68,055	714,033	535,222	3,117,516	2,752,876
Bur.-R. I.	138*	1,634	26,300*	9,938	41,595*	31,796
Cam. & Ind.	5,835	4,255	290	4,868	49,906	55,486
C. of Ga.	28,237	66,792	282,327	377,625	1,343,154	984,085
C. of N. J.	52,011	36,858	282,011	185,425	2,526,654	1,683,572
Cent. Vt.	9,835	77,021	80,523	80,345	473,932	391,669
Char. & W. Car	200	3,779	77,990	10,235	221,578	180,236
C. & O.	96,410	.....	683,582	.....	5,407,892	.....
C. & E. I.	525	13,828	130,428	132,935	1,216,312	903,154
C. & I. M.	10,234	35,019	98,871	14,350	545,111	395,844
C. & N. W.	770,516*	635,787	1,543,381*	1,690,693	7,562,957*	6,435,970
C. B. & Q.	440,396	548,262	2,393,440	2,191,383	8,384,873	4,822,836
C. I. & L.	110,215*	106,674	71,032*	83,462	473,455*	462,006
C. R. I. & P.	400,269	665,322	867,189	1,200,044	7,572,619	5,376,736
C. St. P. M. & O.	217,076*	138,996	305,282*	360,391	1,280,164*	981,079
Colo. & Sou.	32,086	28,959	70,695	76,339	169,656	278,904
C. & G.	48,345	2,768	.....	1,372	155,641	119,511
D. & H.	140,321	178,436	301,108	348,247	2,860,888	2,136,488
D. L. & W.	257,890	111,999	274,784	172,765	2,526,772	1,903,463
Det. & Mack	21,773	26,444	13,243	19,586	139,455	125,792
D. & T. S. L.	4,132	8,199	9,742	4,875	139,885	121,518
D. T. & I.	84,815	47,554	103,484	89,327	535,971	483,688
D. M. & I. R.	170,030	45,883	234,247	136,920	1,314,751	986,498
D. S. S. & A.	13,914*	17,546	39,870*	48,891	209,545*	175,891
E. J. & E.	128,045	158,105	242,091	118,209	1,346,626	1,070,642
Erie	294,009	220,686	710,972	793,148	4,575,900	3,689,834
F. E. C.	54,949	211,680	472,711	51,865	1,808,822	1,303,813
Ft. W. & D. C.	9,804	12,298	89,036	85,452	485,638	370,353
G. N.	687,139	790,243	1,541,970	706,495	10,416,178	8,098,076
G. M. & O.	11,021	81,446	321,792	134,331	1,341,651	1,085,922
I. C.	165,453	217,471	432,266	475,680	10,247,169	8,645,783
Ill. Term.	6,251	13,142	69,342	73,816	354,230	331,158
K. C. Term.	3,647	1,146	39,403	35,881	219,581	211,713
L. S. & Ish.	3,516	34,135	15,502	18,793	255,201	267,575
L. & Hud. R.	26,274	1,346	6,527	8,214	119,569	82,340
L. & N. E.	20,582	9,218	35,637	23,388	396,488	419,678
L. V.	164,187	96,660	247,908	269,259	2,374,426	1,794,295
L. & A.	221,927	103,982	85,909	132,327	808,123	618,056
L. & N.	521,658	367,437	2,131,632	2,223,763	8,633,026	7,387,785
Me. Cent.	13,507	15,350	183,234	111,060	1,103,277	968,973
M. St. P. & S. S. M.	297,253*	180,799	448,021*	295,142	1,986,763*	1,689,523
Miss. Cent.	6,613*	6,269	22,400*	10,024	71,421*	66,698
Mo. & Ark.	3,746	7,667	3,404	1,579	48,762	54,389
M-K-T	184,627	94,243	552,864	312,024	2,890,405	1,824,654
M. P.	858,019*	.....	1,198,898*	.....	14,247,304*	.....
Monongа	18,101	7,838	18,107	6,753	247,360	215,015
Montour	4,861	18,731	5,882	1,898	179,579	164,088
N. C. & St. L.	49,958	60,167	517,259	426,076	1,865,477	1,594,343
Nev. Nor.	15,999	20,507	41,277	28,134	119,878	104,947
N. Y. C.	1,507,168	1,709,939	5,236,198	4,135,827	32,124,729	28,135,788
N. Y. C. & St. L.	43,776	.....	519,234	.....	2,384,464	.....
N. Y., N. H. & H.	259,184	404,445	110,836	581,924	5,750,061	4,853,129
N. Y. O. & W.	15,890	11,624	97,352	7,224	506,330	348,834
N. P.	527,688	291,537	1,441,502	995,351	8,691,214	6,356,806
P. R. R. & L. I.	809,443	1,284,969	3,700,094	3,644,604	50,416,555	49,086,366
Pa.-R. S. L.	3,649	1,961	40,735	46,200	265,914	241,612
P. M.	17,205	.....	583,525	.....	2,572,902	.....
Pitts. & Shaw.	30,291*	12,572	26,465*	23,414	78,327*	67,341
Pitts. Sh. & Nor.	924	26,710	1,534	5,252	78,331	74,600
Reading	52,436	79,332	366,859	209,100	6,025,445	4,537,274
R. F. & P.	.....	.....	.....	.....	1,433,029	1,127,360
Rutland	37,759	23,106	45,015	27,550	331,449	271,800
St. L. S. F.	124,328	174,639	510,436	559,836	3,130,624	2,880,839
St. L. S. W.	136,050*	364,570	218,183*	305,389	2,763,496*	1,766,886
S. P.-Pac. Lines	529,505*	414,064	1,191,970*	1,308,557	8,255,434*	7,656,175
S. P. & S.	28,946*	153,592	346,293*	88,286	1,647,299*	820,905
Tenn. Cent.	.....	.....	20,153	15,490	299,338	250,094
Term. of St. L.	9,134	16,135	30,705	14,016	565,766	415,047
T. & N. O.	212,008	27,018	649,219	516,172	4,229,548	2,884,535
T. & P.	23,874	414,884	464,531	207,936	4,027,717	3,007,900
U. P.	1,281,740	3,437,429	1,365,028	1,391,264	36,445,806	21,741,969
Utah	25,945	29,528	54,951	42,628	166,274	186,577
Virginian	231,134	217,395	412,159	339,861	3,935,333	1,981,729
Wabash	81,456*	21,187	239,517*	376,672	3,458,149*	2,927,043
W. M.	15,108*	.....	394,441*	371,813	1,407,303*	1,282,828
W. P.	223,900*	150,000	138,900*	212,800	1,990,900*	1,465,000
W. & L. E.	137,204	129,965	134,904	157,087	1,128,302	1,119,005

* September.

road shops with material reported by railroads as material), as compared to approximately $393,000,000 of new locomotives and cars installed in 1941. This does not include the value of equipment built for private car lines and war agencies.

Deliveries Off 18 Per Cent

Although railway traffic increased all last year and continues at record levels, railway purchasing—with the exception of rail—began to decline last March and continued to the end of the year. Deliveries of maintenance and repair materials in September, amounting to approximately $53,00,000, were 25 per cent below the March total. Railroads, moreover, received less material each month from May to the end of last year than in each corresponding month of 1941. Deliveries of maintenance and repair materials in October, 1942, were 20 per cent below those in October, 1941.

Dollar for dollar, materials, exclusive of fuel, rail and ties, received by the railroads during the last half of 1942 were smaller by approximately $64,844,000, or 17 per cent, than the corresponding deliveries in the *first* half of the year, and were less by approximately $74,863,000, or 19 per cent, than the corresponding deliveries in the *last* half of 1941. This is a distinct reversal from the trend in the flow of materials to the railroads up to last March, and reflects the effect of government restrictions and other difficulties which have confronted the railroads in obtaining material and starting or continuing work requiring iron and steel, lumber and other scarce items.

The decline in deliveries of materials to the railroads has been widespread, as indicated by the fact that 40 of 61 roads for which comparative figures were available when this was written, received less maintenance and repair materials in August, September and October of last year than in the same months of 1941. The decline was 42 per cent on the Atchison, Topeka and Santa Fe; 28 per cent on the Central of Georgia; 41 per cent on the Central Vermont; 46 per cent on the Chicago & Illinois Midland; 12 per cent on the Delaware & Hudson; 13 per cent on the Elgin, Joliet & Eastern; 25 per cent on the Great Northern; 26 per cent on the Louisville & Nashville; 44 per cent on the Pennsylvania; 20 per cent on the Reading; 22 per cent on the Union Pacific; and 29 per cent on the Wheeling & Lake Erie.

Materials Received and Required

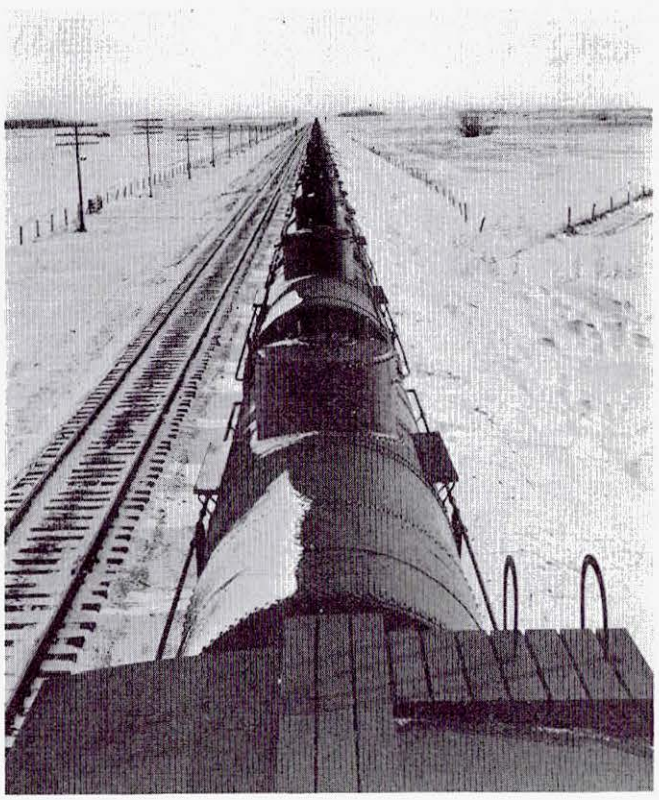
	New Rail Received 10 Months		Cross Ties Received 10 Months		Rail Required in
	1941	1942	1941	1942	1943
	N. T.	N. T.	Units	Units	N. T.
A. C. & Y.	897	113	36,986	60,535	353
Alton	5,574	7,857	281,328	360,736	14,000
Alton & Sou.	1,119	843	19,014	15,697	448
A. B. & C.	1,126	3,444	49,354	104,516	4,480
A. C. L.	8,617	5,921	558,067	863,256	33,200
B. & O.	40,606	35,043	1,608,742	1,301,958	57,860
B. & A.	1,846	2,895	91,463	84,591	3,596
Bing. & Gar.	886	1,121	15,000	32,352	840
B. & M.	11,994	10,750	273,639	426,262	20,541
Bur.-R. I.	....	....	7,586	39,699	....
Cam. & Ind.	335	84	17,569	10,730	280
Cent. Vt.	927	949	21,060	29,140	1,017
Char. & W. Car.	582	623	22,233	110,598	1,120
C. & I. M.	2,069	1,100	15,755	47,476	3,098
C. & G.	....	1,912	23,443	37,798	....
D. & H.	9,526	14,592	101,050	159,778	15,770
D. L. & W.	6,200	8,900	166,000	228,900	16,200
Det. & Mack	....	344	20,945	29,223	358
D. T. & I.	787	2,763	10,018	12,955	3,142
D. S. S. & A.	2,565	1,264	86,000	96,000	1,534
F. E. C.	....	7,847	148,058	359,805	16,500
I. C.	49,373	45,776	1,996,618	1,886,113	85,878
K. C. Term.	1,038	397	25,315	16,023	1,232
L. & N. E.	....	1,297	7,511	9,601	3,032
L. & N.	15,039	23,025	654,924	940,711	68,817
Me. Cent.	....	1,508	123,821	198,903	1,000
M. St. P. & S. S. M.	8,937	10,914	513,000	560,000	14,077
Miss. Cent.	....	569	48,487	43,563	720
Mo. & Ark.	....	....	86,549	87,069	....
M-K-T	....	5,506	438,899	956,339	30,000
Monongа.	448	515	34,758	49,602	956
Montour	560	231	6,501	7,000	350
Nev. Nor.	429	158	31,500	29,900	217
N. Y. N. H. & H.	11,420	18,750	118,560	109,390	23,029
Penna.	103,929	93,803	1,472,058	1,302,498	170,800
Pitts. & Shaw	....	935	7,968	21,919	524
Pitts. Sh. & Nor.	550	....	21,559	11,703	....
R. F. & P.	1,230	1,980	171,700	170,100	3,350
Tenn. Cent.	1,146	1,418	88,010	121,301	2,500
Term. of St. L.	1,320	1,999	24,482	25,495	4,500
T. & N. O.	4,943	19,902	644,008	739,610	27,421
Utah	....	....	1,781	7,006	....
Virginian	12,257	9,524	53,409	254,113	7,831
W. P.	2,548	8,026	358,135	172,286	15,187

Inventories and Consumption

Since the conditions which interfered with the railroads getting new materials also stopped many railway projects, including maintenance work, the railroads are not consuming nearly as much material as would otherwise be the case. By comparison with the trend in material deliveries, however, the trend of material consumption has been generally upward since last March and, as it now appears, the railroads consumed approximately $23,000,000 more new material from June 1 to October 1—the latest month for which consumption figures are available—than they received. These additional materials have necessarily come from inventories.

Class I railroads inventories on November 1 amounted to $515,739,830, including about $52,000,000 of fuel, $18,000,000 of new and second hand rail, $46,000,000 of cross ties and $389,000,000 of other material. The latter includes standby material to protect equipment and also reclaimed materials, but it also contains new materials which were rendered inactive when WPB shut off car and locomotive construction. The aggregate inventory, unadjusted for prices, declined approximately $19,000,000 from July 1 to November 1.

* * *

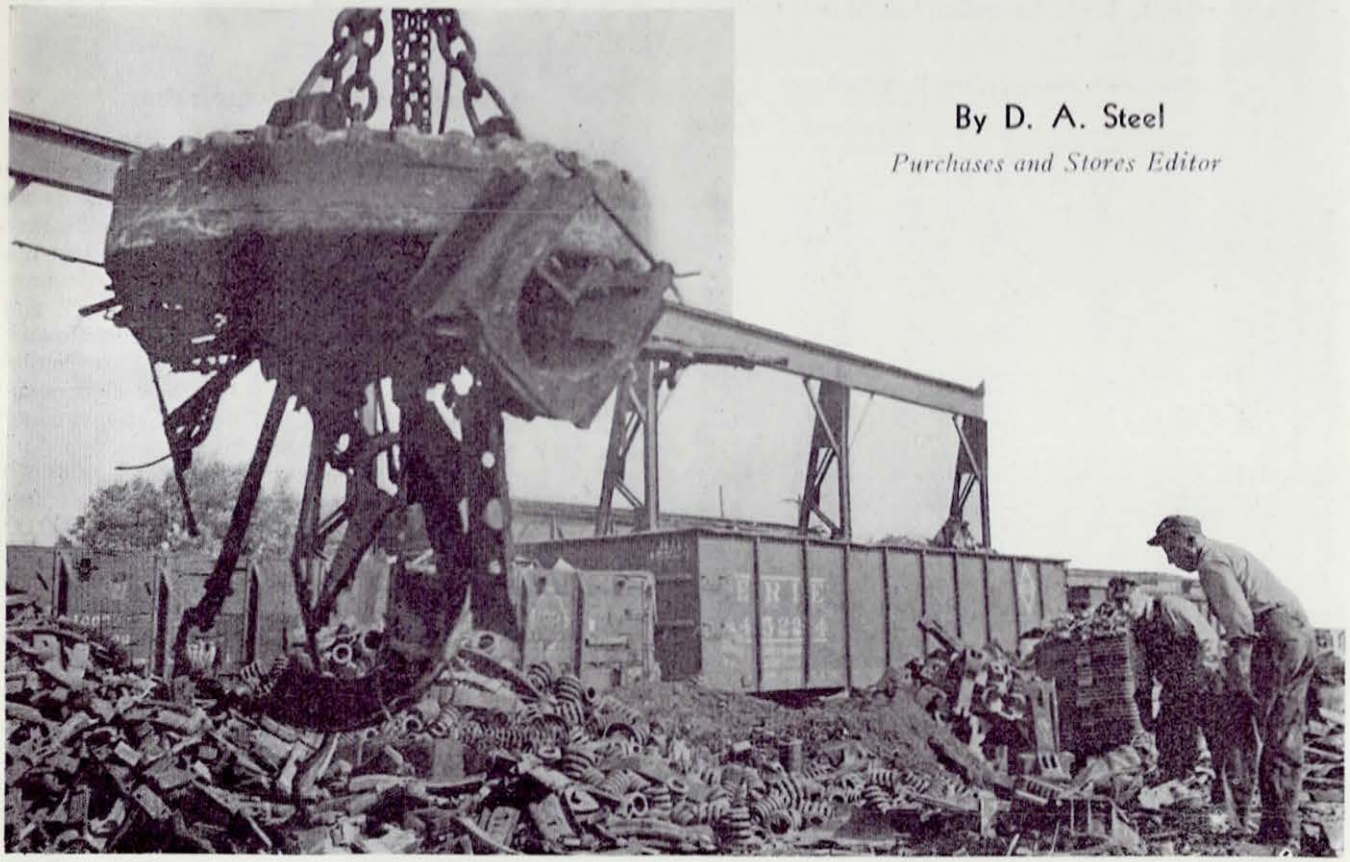


The Movement of Oil to the Eastern Seaboard All-Rail Was an Outstanding Achievement of the Year

Scrap-Gathering Mission Fulfilled

Carriers and employees do outstanding job in salvaging metal and rail but resources are failing with decline in new material

By D. A. Steel
Purchases and Stores Editor



Erie Scrap Goes to War

A REVIEW of railway work at this time, and for that matter since the war began, would be quite incomplete without reference to the role played by the railroads in the nation's search for scrap. It is noteworthy of the current situation that the railroads have all made drives to produce scrap and have been extraordinarily enterprising and effective in this branch of their war work. From now on, however, they face a declining productivity in scrap as the non-recurring supply is cleaned up and they receive less new materials and equipment for maintenance and repair.

The significance of scrap in the war picture lies in the fact that it has been increasingly used as a raw material in making iron and steel and other metals, and because the war has created demands for steel and other materials, including rubber, far in excess of the readily available supply. In 1918, when this country was engaged in War I, mills and foundries produced, in round numbers, 45,000,000 gross tons of steel ingots and 38,000,000 tons of pig iron and ferro-alloys, and melted 27,000,000 tons of iron and steel scrap for the purpose. In 1939, the first year of War II, they produced 28,000,000 tons of ingots and 19,000,000 tons of iron, and used 21,000,000 tons of scrap. In 1940, production jumped to 47,000,000 tons of ingots and 32,000,000 tons of iron, and scrap requirements to 32,000,000 tons. In 1941, ingot production jumped to 82,500,000 tons, requiring 44,000,000 tons of scrap for steel and 17,000,000 tons for iron, or a total scrap demand of 61,000,000 tons; while the program for 1942 called for 90,000,000 tons of ingots, a production equal to the entire output of the rest of the world, with corresponding increases in pig iron and ferro alloys and scrap.

Normally, about half of the scrap is home scrap produced by foundries and mills in the process of making steel, while the other half is obtained by purchase from scrap dealers or consumers of finished metal. In 1939, for example, 15,000,000 tons of the 33,000,000 tons of iron and steel scrap consumed in this country, excluding exports, was purchased, and 18,000,000 tons was home scrap.

Railroads Dependable Sources

The railroads have always been one of the largest and most dependable sources of purchased scrap. In the five years from 1929 to 1933 inclusive, according to a detailed study made by the Federal Coordinator of Transporta-

tion in 1934, Class I, II and III railroads and switching and terminal companies sold 14,807,000 net tons of iron and steel scrap and 209,863,000 lb. of non-ferrous scrap to dealers and consumers. Scrap shipped on sale orders to dealers and consumers in 1929, including the scrap in locomotives and cars sold on wheels, represented 19.43 per cent of the purchased scrap consumed by foundries and mills during that year; and this was exclusive of the scrap produced by private car lines and the Pullman Company in connection with railway operations, and was in price fixing procedures to discourage producers and dealers from hoarding scrap for higher prices. Railroad scrap was kept moving throughout 1940 and 1941, and then—Pearl Harbor.

Plans were under way at the time for additional furnaces to produce pig iron from iron ore, but this capacity would not be available until 1943. Meanwhile, the scrap in the hands of consumers had declined 30 per cent from August, 1941, to January, 1942. Although this condition improved somewhat during the first half of last year,

Iron and Steel Scrap Shipped by Railroads and Scrap Purchased by Consumers—10 Months, 1942* Shipments by Railroads†

	January G.T.	February G.T.	March G.T.	April G.T.	May G.T.	June G.T.	July G.T.	August G.T.	September G.T.	October G.T.	Total 10 Months G.T.	Consumers Receipts of Purchased Scrap G.T.
No. 1 Heavy Melting	54,088	50,389	53,389	56,424	70,073	57,222	58,177	65,376	62,253	67,073	594,464	3,553,002
No. 2 Heavy Melting	852	694	570	512	875	962	1,170	713	651	493	7,492	3,834,249
Bundlles	....	....	....	....	....	48	....	....	....	....	48	2,008,823
Low phos scrap	4,931	4,708	5,359	5,836	4,720	6,354	4,428	5,659	5,805	5,322	53,122	2,040,286
Cast iron scrap	13,338	13,862	16,132	13,931	14,750	16,309	12,549	14,445	17,121	15,664	148,101	3,471,986
Turnings and/or borings	6,813	5,645	6,517	6,723	6,107	7,995	6,787	7,133	7,517	7,330	68,567	2,489,905
Rerolling rails	31,861	28,282	29,897	26,070	17,970	18,728	29,650	31,375	34,357	34,833	283,023	367,786
Scrap rails	20,712	17,779	21,152	14,689	14,784	15,568	20,530	22,689	25,080	25,617	198,600	363,064
Chromium-nickel stainless steel	....	12	....	....	82	....	....	....	....	....	94	34,984
Chromium base stainless steel	3	....	1	....	1	1	1	....	2	2	11	16,525
All compositions of SAE low alloy steels	....	1	....	....	....	....	76	100	....	69	246	426,512
All other prepared scrap	30,765	31,331	34,954	34,729	34,994	35,434	38,790	40,316	42,791	41,444	365,548	1,323,407
Unprepared scrap	18,002	18,284	19,083	15,910	16,421	15,177	15,462	17,851	22,004	21,462	179,656	645,676
Total	181,365	170,987	187,054	174,824	180,777	173,798	187,620	205,657	217,581	219,309	1,898,972	20,576,205

* Bureau of Mines.
† Shipments on sale orders in gross tons to dealers and consumers, exclusive of toll scrap.

exclusive also of the scrap produced by manufacturers in making railway materials and equipment.

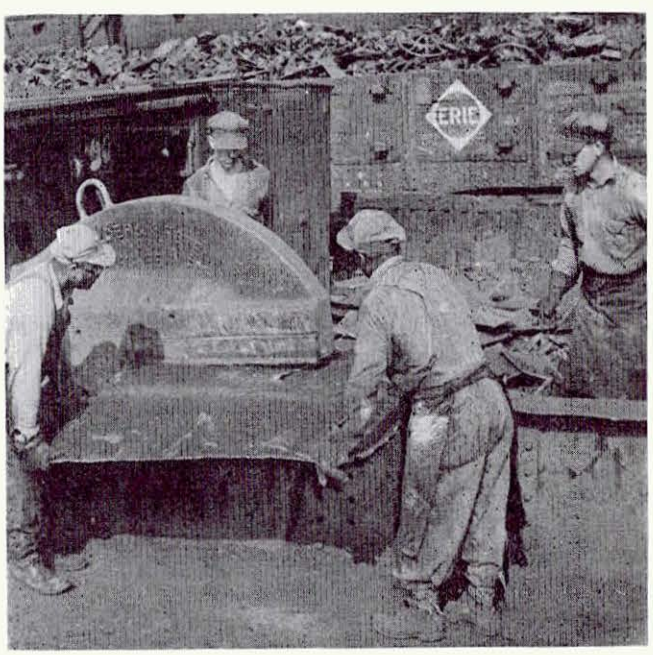
The railroads also produce scrap for their own manufacturing operations and for foundries which make their car wheels and journal bearings. The railroads have never been so prosperous, moreover, that they could disregard the recovery possibilities in their scrap; and periods of scarcity not only taught them reclamation long before the BIC (Bureau of Industrial Conservation of the War Production Board) began beating drums about scrap, but also taught them specialization in sorting and preparing their scrap into grades and varieties and sizes that would bring the best prices. About 65 per cent of railroad scrap sold is classified; and as long ago as 1933, railroads reported more than 170 shops and other facilities specially equipped and operated for scrap handling and reclamation.

In addition, railroads are the principal and, to a large extent, the only means by which railroad and all other scrap reaches the markets and their ultimate consumers. A total of 260,000 cars, containing 11,000,000 tons of scrap, were moved by rail to destination in 1939; 295,000 cars and 13,000,000 tons in 1940; and 105,000 cars, containing 4,500,000 tons, were moved by rail to destination in the first three months of 1941.

Get Early Start

Unlike office workers, housekeepers and school children, whose interest in scrap as a raw material for ships, guns, tanks, etc., had to be aroused, the railroads were already scrap-minded when the war focused attention on scrap and needed little prodding to stimulate their interest in scrap production. As early as 1939, when the Advisory Committee to the Council of National Defense first sounded the "alert" on scrap, all roads were active and many roads were aggressively active in moving scrap and furnishing relay rail for the new defense industries; and it was the railroads who first co-operated with OPA the scrap situation became more acute in other ways. By September, many mills were operating on a day-to-day basis, and it was announced that 6,000,000 tons of scrap had to be obtained quickly and that 17,000,000 tons were required to provide stock piles for winter.

WPB took steps to meet the situation at this time last year by separating the Bureau of Industrial Conservation from the Iron and Steel Branch and starting after auto yards. Industrial and general salvage branches of what is now the Conservation Division were formed, as well as the auto branch, and by February 2, state salvage committees were set up in 23 states and many cities. In March, a special project branch was established to expe-



Preparing Old Car Sides for Remelting

Scrap and Relay Rail Shipped to Dealers and Consumers—10 Months*

Class I Railroads

	Ferrous Metal[1]			Non-Ferrous Metal and Other[2]			Relay Rail			Total Shipped[3]		
	1940 N. T.	1941 N. T.	1942 N. T.	1940 lb.	1941 lb.	1942 lb.	1940 N. T.	1941 N. T.	1942 N. T.	1940 N. T.	1941 N. T.	1942 N. T.
A. C. & Y.	504	384	954	38,233	31,480	46,981	.....	.....	19	523	400	996
Alton & Sou.	915	597	397	14,539	20,020	17,267	345	152	58	1,268	759	464
A. B. & C.	3,875	2,763	4,338	224,699	331,239	246,378	.....	13	1,506	3,988	2,940	5,967
A. C. L.	23,475	39,935	22,911	2,566,367	3,234,643	2,752,943	3,583	6,782	5,810	28,342	48,335	30,098
B. & O.	69,064	79,112	83,281	1,349,800	1,306,800	1,390,010	.....	.....	.....	69,738	79,765	83,976
Bangor & Aroostook	.....	3,178	2,171	.....	344,640	237,252	.....	2,749	1,869	.....	6,100	4,157
Bess. & L. E.	3,975	7,232	7,513	.....	496,530	256,604	215	588	1,102	4,190	8,068	8,743
Bing. & Gar.	202	145	94	.....	6,800	.....	566	744	1,716	768	892	1,810
B. & M.	36,772	25,249	31,358	2,297,962	2,848,770	2,609,782	685	2,309	8,445	38,607	28,983	41,108
C. R. I. & P.	89,753	51,064	43,143	3,649,919	3,556,108	3,647,942	2,023	19,883	21,330	93,596	72,725	66,296
Cam. & Ind.	910	439	676	.....	26,100	16,470	.....	.....	.....	910	452	684
Can. Pac. in Vt.	1,749	3,075	3,795	59,293	106,623	164,770	84	.....	565	1,863	3,128	4,442
Cent. Vt.	4,129	3,458	3,081	198,638	208,180	179,592	.....	.....	.....	4,227	3,562	3,171
Char. & W. Car.	588	1,531	1,378	32,619	47,603	46,184	364	.....	.....	969	1,555	1,402
C. & E. I.	8,424	5,004	9,271	582,234	571,678	665,116	4,407	1,400	1,663	13,122	6,689	11,266
C. & I. M.	2,665	2,085	2,527	133,555	266,801	189,071	.....	417	810	2,732	2,635	3,432
Colo. & Sou.	.....	7,663	4,531	.....	676,224	656,757	.....	4,350	463	.....	12,351	5,322
C. & G.	239	1,327	833	.....	58,000	38,423	.....	1	398	239	1,357	1,250
D. & H.	22,802	27,025	26,526	1,216,700	1,498,152	1,890,040	25	1,065	5,639	23,436	28,839	33,110
D. L. & W.	46,735	26,665	23,424	1,792,687	2,063,945	1,993,929	6	43	474	47,637	27,739	24,894
D. T. & I.	2,616	3,052	2,727	240,000	230,000	174,000	93	222	457	2,829	3,389	3,271
Det. & Mack.	207	376	360	4,509	14,802	37,997	.....	.....	.....	210	384	379
D. S. S. & A.	2,948	3,263	1,756	22,687	19,941	19,327	.....	.....	490	2,959	3,273	2,255
F. E. C.	3,696	6,847	9,614	2,750	3,950	12,658	33	1,036	15,318	3,730	7,885	24,938
Ft. W. & D. C.	.....	2,307	2,080	.....	278,000	310,000	.....	426	60	.....	2,872	2,295
G. N.	57,453	75,178	62,396	2,621,339	3,135,792	2,934,820	4,559	1,227	1,765	63,322	77,972	65,628
G. B. & W.	963	1,414	938	30,601	25,625	17,506	.....	.....	.....	979	1,427	947
G. T. W.	18,455	22,198	15,729	854,037	1,134,979	975,279	.....	.....	.....	18,882	22,765	16,217
K. C. Term.	1,629	1,290	1,488	247,245	228,331	248,049	.....	77	215	1,752	1,481	1,827
L. S. & Ish.	356	3,648	1,020	.....	25,147	9,204	3	36	428	359	3,696	1,453
L. & A.	2,772	10,774	3,250	89,353	157,351	187,643	38	1,492	2,919	2,855	12,345	6,263
L. & N.	81,171	75,684	52,141	1,901,280	1,754,723	2,371,594	943	2,565	16,513	83,064	79,125	69,840
L. & N. E.	818	5,288	2,421	68,842	98,817	113,797	134	884	1,703	986	6,221	4,181
M. & St. L.	.....	.....	3,941	.....	.....	348,000	.....	.....	1,082	.....	.....	5,197
M. St. P. & S. S. M.	24,027	21,670	16,027	543,494	792,353	1,371,336	.....	.....	855	24,299	22,066	17,568
Miss. Cent.	22	47	538	10,181	10,644	17,517	47	25	575	74	77	1,121
Mo. & Ark.	464	351	436	4,853	6,353	3,790	.....	.....	.....	467	354	438
M-K-T	13,053	11,920	15,322	998,799	922,812	1,135,581	3	1	120	13,555	12,382	16,009
Monongа.	1,018	398	869	48,613	34,136	66,164	194	228	.....	1,237	644	903
Montour	870	887	728	35,411	18,170	21,344	.....	.....	31	887	896	769
Nev. Nor.	168	195	724	19,730	17,490	19,570	.....	.....	.....	177	203	733
N. Y. C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	201,251
N. Y. N. H. & H.	57,954	41,504	35,860	2,696,435	3,940,628	2,907,598	782	3,264	14,207	60,083	46,738	51,520
P. R. R.	366,250	375,017	327,636	.....	282,000	5,592,000	.....	.....	36,145	366,250	375,158	366,577
Pitts. & Shaw.	791	878	663	6,015	5,982	4,937	4	198	13	799	1,079	679
Pitts. Sh. & Nor.	898	179	1,032	18,312	20,147	18,338	.....	.....	.....	907	189	1,041
R. F. & P.	.....	3,757	4,558	.....	285,000	290,000	.....	511	1,466	.....	4,408	6,169
Southern	74,767	78,567	87,058	7,130,000	7,951,666	8,840,000	5,219	6,095	25,584	83,551	88,638	117,062
Tenn. Cent.	1,358	1,962	2,411	50,503	45,764	48,762	124	55	121	1,507	2,040	2,556
Term. of St. L.	3,168	2,808	3,998	113,338	104,559	62,103	.....	.....	3,477	3,224	2,860	7,506
T. & N. O.	30,257	28,332	30,289	1,248,841	1,841,644	1,866,062	819	4,036	8,945	31,701	33,290	40,168
U. P.	.....	.....	.....	.....	.....	.....	.....	.....	.....	84,642	104,927	179,770
Utah	216	41	298	.....	38,000	28,000	.....	.....	.....	216	60	312
Virginian	11,414	10,605	14,930	644,149	623,754	616,604	149	10,709	1,858	11,885	21,626	17,096
W. P.	7,232	5,233	6,320	243,166	434,171	513,184	99	376	2,933	7,455	5,826	9,509

Other Railroads

Akron & Bar. Belt.	43	201	131	.....	.....	.....	10	38	147	53	239	278
Allegheny & Sou. Side	7	5	10	292	.....	.....	.....	.....	.....	7	5	10
Apache	.....	.....	197	.....	.....	.....	.....	.....	.....	.....	.....	197
Arkansas	.....	308	32	.....	.....	.....	.....	95	.....	.....	403	32
B. & O. C. T.	1,409	1,593	1,257	.....	.....	.....	.....	.....	.....	1,409	1,593	1,257
Balt. & Anpls.	13	748	34	.....	15,037	9,983	.....	.....	.....	13	756	39
Barre & Chelsea	22	22	20	.....	.....	.....	16	.....	21	38	22	41
Bellefonte Cent.	.....	538	778	.....	.....	.....	.....	95	137	.....	633	915
Bennettsville & Cheraw.	.....	.....	99	.....	.....	.....	.....	225	.....	.....	225	99
Birming. Sou.	104	269	161	.....	.....	.....	.....	.....	.....	104	269	161
Bois d'Arc & Sou.	.....	.....	.....	.....	.....	.....	.....	43	.....	.....	43	.....
Brook. East. Dist. Term.	88	20	27	.....	.....	4,845	60	75	82	148	95	111
Buff. Creek & Gauley	92	252	185	.....	.....	.....	.....	.....	.....	92	252	185
Bush. Term.	.....	9	17	.....	.....	3,000	.....	110	51	.....	119	70
Carrollton	.....	.....	.....	.....	.....	.....	.....	.....	400	.....	.....	400
Cheswick & Harmar	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21
Chi. & Cal. Riv.	6	.....	49	.....	.....	.....	.....	.....	.....	6	.....	49
Chi. Short Line	120	130	87	1,276	12,880	7,750	.....	.....	.....	120	136	100

Efficiency for Victory

Chi. S. S. & South Bend	264	288	130	44,194	40,669	45,320	.....	.....	205	285	309	357
Chi. West Pull.	381	138	240	.....	8,050	11,830	.....	.....	23	381	142	268
Clarendon & Pittsford	.....	98	66	.....	.....	.....	.....	.....	160	.....	98	226
Colo. & Wyo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	655	1,284	905
Colum. Newberry & Laurens	.....	.....	27	.....	.....	.....	154	.....	137	154	.....	164
Copper Range	429	140	137	7,067	3,339	2,693	.....	.....	.....	433	142	139
Coudersport & Port Allegh.	19	2	.....	.....	.....	.....	.....	.....	.....	19	2	.....
Cowlitz Chehalis & Cascade	82	20	179	3,270	.....	942	.....	.....	.....	83	20	179
Cumberland & Pa.	131	146	276	4,208	1,780	.....	.....	.....	.....	133	147	276
Dansville & Mt. Morris	.....	53	.....	.....	.....	.....	.....	.....	.....	.....	53	.....
Detroit Term.	.....	173	.....	.....	8,570	16,845	.....	846	240	.....	1,023	248
Donora Sou.	.....	.....	819	.....	.....	5,062	.....	.....	.....	338	610	821
Duluth & N. E.	383	249	240	.....	5,581	.....	.....	.....	.....	383	251	240
Durham & Sou.	73	.....	122	.....	.....	3,149	.....	.....	.....	73	.....	123
East Carolina	.....	.....	.....	.....	.....	.....	.....	87	.....	.....	87	.....
East Jordan & Sou.	.....	132	125	578	.....	1,656	.....	.....	5	.....	132	131
Fenwood, Col. & Gulf.	.....	.....	41	.....	.....	.....	.....	.....	.....	.....	.....	41
Galveston Wharves	.....	312	42	.....	.....	.....	1	1	1	1	313	43
Greenville & Nor.	23	.....	84	.....	.....	1,034	.....	.....	.....	23	.....	84
Harbor Belt Line	96	258	146	3,286	250	2,008	.....	.....	.....	97	258	147
Hoosac Tunnel & Wil.	.....	.....	.....	.....	.....	.....	40	.....	50	40	.....	50
Ill. Nor.	136	324	318	5,763	.....	8,905	.....	48	.....	138	372	322
Interstate	1,265	1,760	989	31,629	9,835	27,173	.....	177	68	1,281	1,942	1,070
Jacksonville Term.	272	275	315	15,493	5,176	4,976	.....	52	232	280	330	549
Jay St. Conn.	12	12	12	.....	.....	.....	.....	.....	.....	12	12	12
Ky. & Ind. Term.	635	1,618	1,471	172,106	236,550	169,874	.....	.....	.....	721	1,736	1,556
Lakeside & Marblehead	10	98	130	1,273	.....	.....	.....	.....	.....	10	98	130
Laramie N. Pk. & West.	39	63	59	.....	2,080	.....	.....	21	142	39	85	201
Ligonier Val.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15
Live Oak Perry & Gulf	.....	.....	.....	.....	.....	.....	.....	.....	223	.....	.....	223
Manufacturers	.....	.....	354	.....	.....	3,777	.....	.....	.....	.....	.....	356
Mfrs.' Junc.	75	93	118	.....	864	606	104	123	104	179	216	222
Marianna & Blountstown	.....	.....	22	.....	.....	.....	.....	.....	.....	.....	.....	22
Midland Term.	186	449	927	5,670	3,398	3,833	.....	.....	.....	189	451	929
Mont. West.	.....	.....	.....	.....	.....	790	.....	.....	.....	.....	.....	.....
Mont. Wyo. & Sou.	.....	.....	133	.....	4,209	893	.....	.....	.....	.....	2	133
Montpelier & Wells Riv.	74	73	84	3,000	5,550	.....	.....	.....	65	75	76	149
Moorehead & N. Fork	27	67	31	.....	.....	.....	.....	.....	27	27	67	58
Newburgh & S. S.	1,577	444	464	15,380	22,668	8,041	.....	.....	.....	1,584	455	468
N. O. & Lower Coast	2	35	94	.....	320	500	.....	.....	.....	2	35	94
Nor. & Portsmouth Belt Line	157	127	127	9,499	11,288	5,513	.....	.....	.....	162	133	130
N. E. Okla.	403	502	545	392,437	4,913	2,462	.....	.....	139	600	504	685
N. P. Term. of Ore	134	296	304	34,060	29,369	19,321	.....	.....	.....	152	311	314
Okmulgee Nor.	.....	55	107	176	.....	.....	.....	.....	.....	.....	55	107
Oneida & West.	.....	.....	110	.....	.....	.....	.....	.....	.....	.....	.....	110
Pac. Coast	322	91	65	327	3,626	1,000	252	204	76	574	297	141
Pitts. Allegh. & McK. Rocks.	.....	.....	68	.....	.....	.....	.....	.....	.....	.....	.....	68
Pitts. Chartiers & Yough.	112	28	80	.....	.....	.....	.....	.....	.....	112	28	80
Port Townsend Sou.	.....	.....	.....	.....	.....	.....	33	33	36	33	33	36
Potomac Edison Co.	25	16	69	.....	4,038	5,392	.....	5	102	25	23	173
River Term.	539	775	400	3,080	7,600	14,970	90	35	143	630	815	550
R. I. Sou.	.....	493	629	.....	.....	151,800	.....	.....	.....	.....	493	705
St. Johns & L. Champlain	.....	.....	.....	.....	6,000	.....	.....	.....	294	.....	3	294
St. L. & Hannibal	320	.....	60	.....	.....	1,456	.....	.....	.....	320	.....	61
St. L. & O'Fallon	.....	.....	161	.....	.....	2,429	.....	.....	.....	.....	.....	162
Skaneateles S. L.	.....	.....	.....	.....	.....	37,040	.....	.....	.....	.....	.....	18
Sioux City Term.	.....	13	.....	307	.....	410	7	47	106	7	60	106
South Omaha Term.	223	193	7	.....	.....	.....	.....	.....	.....	223	193	7
Springfield Term.	.....	.....	.....	.....	.....	.....	.....	.....	7	.....	.....	7
State Belt	60	110	228	.....	.....	.....	477	240	212	537	350	440
Tallulah Falls	2	28	46	2,000	2,000	2,000	.....	.....	.....	3	29	47
Tenn. & Nor. Car.	.....	89	30	.....	2,000	.....	.....	.....	.....	.....	90	30
Term. of Ala. State Docks	.....	.....	259	.....	.....	10,850	.....	.....	.....	.....	.....	264
Toledo Peoria & West.	1,715	835	1,669	33,272	41,558	53,969	.....	.....	2,451	1,733	856	4,148
Toledo Term.	198	145	292	.....	13,010	10,426	180	148	423	378	300	720
Tooele Val.	20	70	44	.....	.....	.....	205	.....	.....	225	70	44
Trona	.....	.....	210	.....	.....	3,431	.....	.....	.....	.....	.....	211
Tucson Cornelia & Gila Bend	2	12	21	.....	8,400	1,674	.....	.....	6	2	16	28
Tuskegee	.....	.....	46	.....	.....	4,000	.....	.....	.....	.....	.....	48
Union R. R.	3,368	5,312	5,899	2,810	119,975	51,192	.....	.....	.....	3,369	5,372	5,925
Union Term.	132	83	18	230	.....	1,054	.....	.....	.....	132	83	19
Va. & Car. Sou.	.....	.....	67	.....	.....	.....	.....	.....	.....	.....	.....	67
Va. Blue Ridge	.....	63	.....	.....	.....	.....	110	30	48	110	93	48
Wash. Ida. & Mont.	61	120	78	1,840	1,532	2,956	.....	.....	.....	62	121	79
West. Allegh.	284	313	397	.....	.....	.....	.....	34	4,082	284	347	4,479
Win.-Sal. Southbound	2	79	371	1,099	927	.....	.....	.....	.....	3	79	371
Youngstown & Nor.	259	43	4	75	669	.....	.....	.....	.....	259	43	4

* As reported to *Railway Age* by co-operating railroads.
[1] Includes scrap wheels. [2] Includes rubber and miscellaneous. [3] With or without scrap wheels and relay rail as reported.

Efficiency for Victory

In a Railroad Scrap Yard Where Sorters also "Serve" in the War Effort

dite the movement of scrap from abandoned street car and railroad tracks and buildings tied up by legal and financial difficulties. Scrap dealers were licensed. In June, the rubber drive was launched; in July came the drive for tin cans and a million and a half dollar program of advertising with government funds to promote the increase in the flow of dormant scrap. Campaigns were started among school children and in cities and the press was requested to get behind the drives. WPA funds were used to gather scrap, and in August, War Materials, Inc., a subsidiary of the RFC with $500,000,000 of credit was formed to finance the wrecking of bridges, buildings, etc., for scrap, which could not be obtained at going prices. In October, WPB had established regional branches of the Conservation Division in every state, with 13,000 county and local committees, while 2,500 salesmen of industries were assigned to the general and special salvage work.

Scrap Shipped on Sales Orders*

	Ferrous Metal Net Tons	Non-Ferrous Metal lb.
1929	4,552,724	52,177,632
1930	3,430,384	50,986,333
1931	2,253,788	39,461,864
1932	1,587,962	31,002,276
1933	2,982,318	36,235,692
5 yrs.	14,807,176	209,863,797
Av. per yr.	2,961,435	41,972,759

* Class I, II and III railroads and switching and terminal companies. From report of Federal Coordinator of Transportation, 1934. Excludes toll scrap and scrap in equipment sold on wheels.

Launch Drives

Railroads redoubled their energies. On their own initiative or at the request of the railroad unit of the Conservation Division of WPB, every railroad which had not previously done so appointed salvage directors or a salvage committee of officers from each department, with corresponding committees on each division of the railroad and in the larger scrap producing areas. Scrap clean-up drives were launched or renewed to arouse the interest and obtain the co-operation of officers and employees of every class and grade in an all-out victory campaign for the now precious metal. Many drives were conducted by chief executives in person, travelling over the railroads by business car, motor car and on foot. Committees were generally given authority to make decisions on the ground as to what should be scrapped or saved. Contrary to precedents, cost was no object if material could be released, and decisions with respect to new materials, as well as old materials, usually hinged on the present rather than on the future importance of the material to the railroad.

Tracks were combed from end to end and from one right of way fence to the other by competent persons and all waste and unused materials were picked up, even to fence wire, tin cans and other refuse which had been thrown away because they once had no sale value. Turnouts, industry tracks and street crossings were overhauled for rail and track materials which could be released, and the search for scrap extended into shop lockers, into attics and basements of buildings and to trash dumps. Underground steam and water lines of abandoned terminals, also piping, conduit, plumbing and wiring in old buildings were recovered in these drives. Storehouses and material yards yielded carloads of inactive materials. Some roads sacrificed rail rests and other metal foundations in material yards. Signal towers and steel bridges not in use were demolished; while thousands of guard rails on bridges and in tunnels were removed, together with the rail hand car rests at section houses, and many spurs were shortened or removed altogether for the rail they contained.

As the campaigns progressed, railway labor unions registered their interest in the nation-wide hunt for scrap and enlisted their membership in the search, with the result that thousands of tons of scrap were unearthed which were unknown to regular salvage forces. One employee brought to light a buried track which produced 750 tons of scrap; a tip from another resulted in unearthing a spur fully two miles long which, with the abandoned building at the other end, produced 1,000 tons of scrap. Forgotten caches of material were found in these drives. Dumps were excavated to remove trucks and rails left under cars which had been retired and used

Iron and Steel Scrap from Retired Equipment*

	Locomotives Net Tons	Freight Cars Net Tons	Passenger Cars Net Tons	Total Net Tons
1932	214,000	986,000	27,000	1,227,000
1933	240,000	1,644,000	42,000	1,926,000
1934	274,000	1,796,000	46,000	2,116,000
1935	197,000	1,643,000	42,000	1,882,000
1936	164,000	1,704,000	20,000	1,888,000
1937	97,000	1,222,000	17,000	1,336,000
1938	113,000	912,000	20,000	1,045,000
1939	166,000	1,113,000	16,000	1,295,000
1940	126,000	823,000	15,000	964,000
9 yrs.	1,591,000	11,843,000	245,000	13,679,000

* Estimated from number of cars and locomotives retired for demolition or sale as scrap reported by ICC.

for buildings, and steam shovels were put to work mining fills for metal. The drives, once sincerity in their announced purposes was established, received the generous support of employees and produced results which surprised even the railroads. One executive said he had never seen the equal of the enthusiasm shown by employees in that railroad's drive. Following scrap collection work in 1940, another railroad thought that its property was "about as clean as a hound's tooth" until a more thorough drive was launched in 1941.

Over 4,000,000 Tons

Figures at this time, though too incomplete to be final, indicate that the railroads produced 3,376,000 net tons of iron and steel scrap last year, consisting of 2,650,000 net tons of prepared and unprepared iron and steel scrap shipped on sales orders to dealers and consumers and 726,000 net tons of scrap wheels, including scrap wheels handled with foundries under toll agreements. In addition, they produced about 72,000 net tons of non-ferrous scrap, including toll scrap, and about 7,000 tons of rubber and miscellaneous scrap—bringing shipments of iron and steel and other scrap to approximately 3,455,000 net tons. This does not include scrap of private car companies, the scrap produced in maintaining cars owned by the Pullman Company nor scrap produced by builders of cars and locomotives or manufacturers of railway material. It also excludes scrap from small railroads which was shipped as industrial scrap; and it also excludes a large but undetermined amount of scrap in railroad buildings and bridges which were or will be demolished through War Materials, Inc., for the scrap in them.

In addition, they released in the neighborhood of 85,000,000 lin. ft., or 10,000 track miles, of relay rail, weighing about 1,000,000 tons with fastenings, for distribution by the War Production Board to war industries and military forces, thus bringing shipments of scrap and relay rail by the railroads last year to 4,455,000 net tons.

About 12 per cent less iron and steel scrap was shipped on sale orders to dealers and consumers than in 1940 and 1941, but the tonnage was extraordinarily large when it is considered that the railroads made no large scale retirements of equipment as in previous years and maintained a uniform flow of scrap in the three previous years. During 1942, moreover, scrap production was definitely on a rising trend, with shipments of iron and steel scrap to dealers and consumers—as reported to the Bureau of Mines by the railroads—totaling 218,309 gross tons in October—the latest month for which figures are available—reflecting from 20 to 28 per cent more scrap than was shipped during each of the first seven months of the year. Iron and steel scrap shipped on sales orders by railroads was 9.23 per cent of the purchased scrap received from all sources by consumers of the metal during the 10 months.

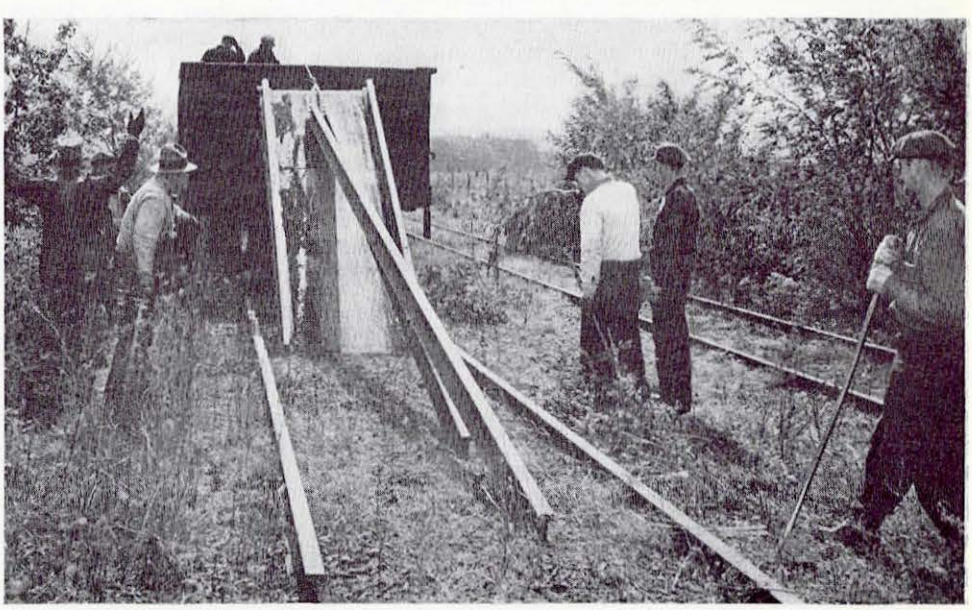
Scrap Shipped by Railroads to Dealers and Consumers*

	1940 Net Tons	1941 Net Tons	1942 Net Tons
Scrap wheels†	546,000	704,000	726,000
Other ferrous scrap	2,994,000	3,009,000	2,650,000
Total ferrous scrap	3,540,000	3,713,000	3,376,000
Non-ferrous metal scrap†	47,000	63,000	72,000
Rubber and other scrap	5,000	5,000	7,000
Total scrap shipped†	3,592,000	3,781,000	3,455,000
Relay rail and fastenings	....	....	1,000,000
All scrap and relay rail	....	....	4,455,000

* Scrap estimated from figures compiled by Bureau of Mines and reports received by *Railway Age*. Subject to revision. Relay rail estimated by War Production Board.
† Including toll scrap.

Exceed Relay Rail Goal

The work that was done by the railroads, individually and in the aggregate, in tearing up abandoned lines to obtain rail for defense plants and military railways in this country and abroad last year was an accomplishment without precedent. Less than 10 per cent of this rail was taken under the requisitioning powers of the government and some of that tonnage was removed without objection from the railroads. During June, Lt. Gen. B. B. Somervell, commanding general, Service of Supply, U. S. Army, writing to Donald Nelson, chairman, WPB, said, "We are experiencing considerable difficulty in procuring sufficient relay rail. This situation is quite serious and is having a detrimental effect on our war effort." In November, B. C. Bertram, director of the Railroad Unit of the Conservation Division, WPB, speaking in San Francisco, reported that in nine weeks and two days from the first rail conference in New York City on July 7, 40,000,000 ft. of relay rail had been allocated to the



Tearing up Old Track on the New York Central to Obtain Rail for the Army — All Railroads Shared in Such Work

Army, Navy and Maritime Commission production and to industrial plants built in connection with the war effort. During October, the army officer in charge of one of the largest receiving centers for this rail admitted being swamped.

During the first 10 months of 1942, the Baltimore & Ohio shipped approximately 84,000 tons of scrap, exclusive of relay rail. The 41,000 tons of scrap and relay rail shipped by the Boston & Maine in the same period was 13,000 tons more than in the corresponding months of 1941. The Florida East Coast shipped approximately 25,000 tons of scrap and relay rail in 10 months of last year, as compared to only 8,000 tons in the same period of the previous year. Scrap and relay shipments totaled 65,000 tons on the Great Northern, 16,000 tons on the Missouri-Kansas-Texas and 51,000 tons on the New York, New Haven & Hartford. The Southern's shipments of scrap and relay rail in 10 months last year, totaling 117,000 tons, were 30,000 tons more than was shipped in the same period of the two previous years.

The Union Pacific shipped 200,835 net tons of scrap and relay rail during the first 11 months of last year, as compared to 115,553 tons in the same period of 1941, and 92,318 tons in the same months of 1940. In 10 months last year, the Pennsylvania's shipments consisted of 320,636 net tons of iron and steel scrap, 2,796 tons of non-ferrous metals and 2,711,000 lin. ft. of rail for government projects, excluding 2,818,000 lin. ft. of rail used in extending its own yards and for defense plant sidings on its own line. This compares with 375,017 net tons of ferrous scrap and 141 tons of non-ferrous metals in the first 10 months of 1941, and 366,250 net tons of ferrous scrap produced during the first 10 months of 1940. The New York Central Lines shipped 201,251 net tons of scrap, exclusive of relay rail and scrap wheels, to dealers and consumers during the first 10 months of 1942; and their releases of relayer rail for war plants and army camps in the 10 months totaled about 45,000 tons. Comparisons have not been made with previous years. As shown by tables in this issue, the Soo, the Missouri-Kansas-Texas, the Chicago & Eastern Illinois, the Southern and the Western Pacific, as well as the Pennsylvania all shipped a great deal more non-ferrous scrap last year than in previous years.

The scrap situation has been eased temporarily by accumulations which permitted a considerable carry over into this year, but the need for scrap continues. In spite of statements that steel mills are resting easy and that scrap dealers are overstocked, L. J. Rosenwald, director of the Conservation Division of WPB, reported on November 28 that most of the non-recurring scrap has gone into armament shipped abroad. Consequently, the problem of getting required iron and steel scrap for next year's production will entail still deeper penetration of the dormant scrap resources of industry, of the farm and of the heavier household metals. Current mill inventories of scrap are not large enough to satisfy probable future demands, and the situation could easily become acute again in less than a week.

The Prospects

Railroads are being pressed to continue their efforts, but the outlook for a sustained high rate of scrap production by them is not bright. In the nine years from 1932 to 1940, 15,917 locomotives, 789,581 freight cars and 12,202 passenger cars went into the scrap pile, producing an average of at least 1,500,000 net tons of scrap per year. By contrast, the railroads now need all the equipment they have and they have not been permitted to obtain large numbers of new locomotives and cars. They are also obtaining restricted amounts of new materials for maintenance and operation, which means less scrap, and increases the proportionate amount of scrap which must be reclaimed. Much of the scrap released by the railroads last year came from abandoned facilities, and the volume of this scrap appeared to have been maintained at a relatively uniform rate, at least up to October; but this scrap is not recurring and the resources are not inexhaustible. Labor is also increasingly less available for scrap collection. Notwithstanding the need of the country for scrap, it is highly improbable that the railroads can produce the tonnage this year that was produced in previous years, and this is one of the aspects of the war which will doubtless require further attention from the agencies who now control their supplies.

Higher Material Costs

(*Continued from page 94*)

in that territory from obtaining the materials they required. Then OPA orders eliminated the price competition, but under WPB orders the roads have not been able to obtain quality lumber.

Order M-216, regulating prices of railroad cross ties, has not been working well. In the South, some railroads think that narrowing the margin between the prices of low grade lumber and cross ties might bring out some more ties, but other factors, which prices cannot overcome, include the loss of tie producing labor to the armed forces and national defense projects, which are paying high rates of pay, and also include truck, tire and gas rationing. Competition created by paper mills paying high prices for pulpwood is also a factor in the Southern territory. Furthermore, since prices for low grade lumber have been so high, a number of small portable mills have been set up to produce this lumber, and it is reasonable to assume that they will continue to do so, even if an increase in the price of ties is authorized by OPA. It now appears that the war agencies have about reached the saturation point on ties and that the government's requirements for lumber will be reduced. Railroads are restricted to a 60-days stock of lumber and will probably be able to maintain that stock during the present year with the arrangements that are now under consideration, but they will be exceedingly fortunate if they obtain for application in 1943 the same number of ties that were applied in 1942.

On the West Coast, the prices paid by the railroads on their grade requirements have followed the prices to be paid on government purchases, except in particular purchases by contractors working on government orders who apply the differentials permitted under Price Schedule No. 26. The higher grade structurals have been in heaviest demand for government requirements, and have been and will be the most difficult for the railroads to obtain. In order to meet this situation, most of the railroads have revised their grade specifications to permit a wider range of purchases by accepting a lower grade where safety of operation is not involved. Although, as the most recent announcements from Washington indicate, government requirements will be curtailed, it is considered probable on the West Coast that they will remain heavy through 1943, especially in the case of the higher grades of structural items. Common grades of lumber which have been going into camps and similar construction will probably be somewhat easier to obtain this year. As to cross tie requirements in the West, indications are that the government purchases have passed their peak, which should improve railroad prospects for meeting requirements for Western ties.

Rail Abandonments Set New Record

Stimulated by an urgent need for all classes of usable rail, 2,516 miles of lines were abandoned in 1942

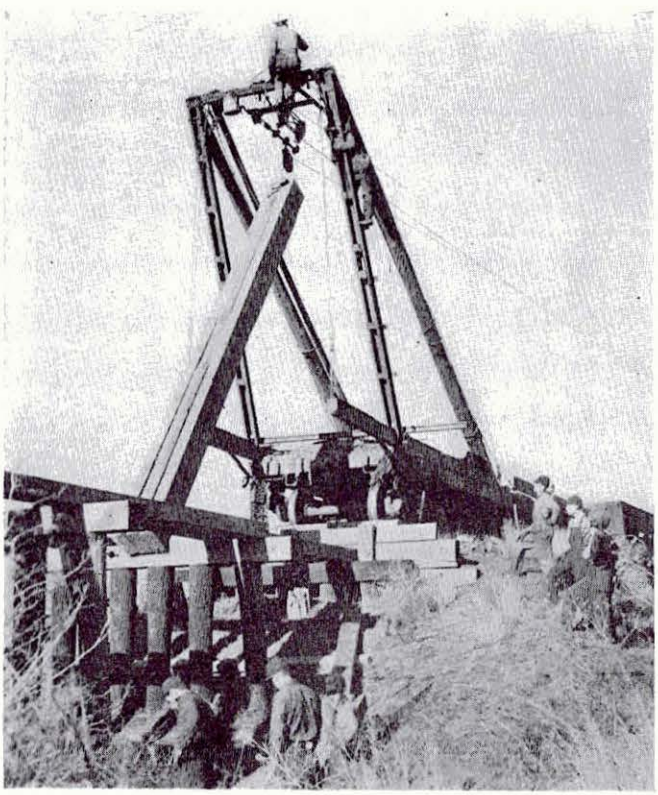
By George E. Boyd

Associate Editor

RESPONDING to insistent demands for scrap steel to insure a steady flow of arms, ammunition and equipment to our fighting forces; to an equally insistent demand for released rail to provide tracks for war industries, training camps, ship yards, ordnance depots, arsenals, navy stores and fortified areas; and to similar demands for materials to equip the military railway battalions that are with our overseas forces; the railways of the United States abandoned more miles of lines during 1942 than in any previous year. These abandonments were not confined to any particular railway or group of railways or to any section of the country, but involved many roads and ramified into every part of the United States, as well as into Canada and Mexico.

However, the close of 1942 did not mark a cessation of the campaign for abandonments of railway lines which was under way during the year, for at the end of the year the War Production Board was still requisitioning lines which it believed could be abandoned without detriment to the public welfare, with the purpose of guiding the released rail into those channels where it would be most useful in the war effort. As a result, as the year closed, an unusual number of applications for abandonments were pending before the Interstate Commerce Commission which, because of the nature of the demands that had actuated almost all of the petitions, has made every effort to expedite consideration of the requests. Both the army and the navy are sorely in need of usable rail, and the need of the steel mills is fully as great for the scrap that is incidental to all abandonments and which will make a welcome addition to the tonnage they are receiving. It seems quite probable, therefore, that a large mileage of lines will be abandoned again in 1943.

Preparing to Take up the Track at Promontory Point, Utah, Where the Golden Spike Was Driven, May 10, 1869



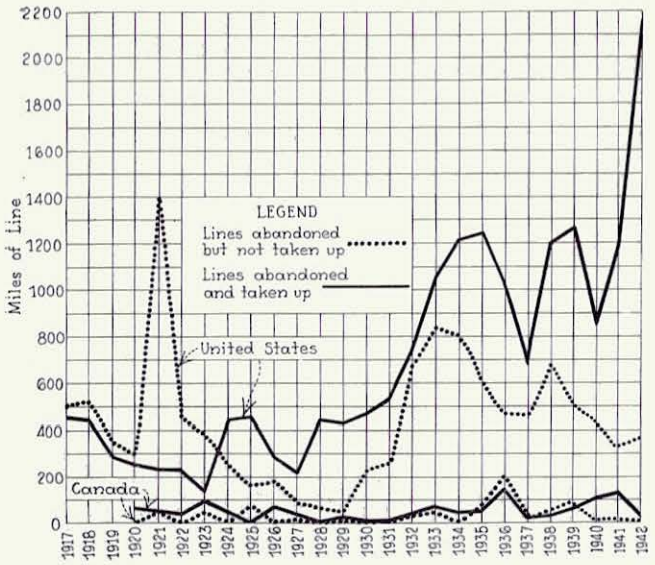
Removing a Trestle on the Abandoned Hastings Line, Chicago & North Western

Abandonments Pass 2000-Mile Mark

There was not only a sharp increase in the mileage of lines abandoned in 1942, compared with the previous year, but for the first time they passed the 2,000-mile mark to set an all-time record of 2,516 miles abandoned, which was 1,007 miles more than were abandoned in 1941 and 521 miles more than the previous maximum of 1,995 miles, which had stood as the record since 1934. While this is the first time that abandonments in the United States has exceeded 2,000 miles, although this mark has been approached several times, it is the twelfth time since the record of abandonments was first compiled and the eleventh consecutive year in which they have exceeded 1,000 miles. It is significant as showing the present trend in railway construction and

Miles of Lines Abandoned in the United States Since 1916

Year	Miles	Year	Miles
1917	942	1930	694
1918	959	1931	795
1919	637	1932	1,452
1920	536	1933	1,876
1921	1,626	1934	1,995
1922	677	1935	1,843
1923	513	1936	1,523
1924	693	1937	1,140
1925	606	1938	1,897
1926	457	1939	1,783
1927	282	1940	1,299
1928	512	1941	1,509
1929	475	1942	2,516



Abandonments in the United States Reached the Record Figure of 2,516 Miles in 1942. Those in Canada Aggregated 23 Miles

in highway competition that the total abandonments for 1942 were 2,442 miles more than the mileage of new lines completed during the year. It is also of more than casual interest that only 22 railways in the United States individually exceed in mileage the aggregate miles of lines abandoned in this country during 1942.

Usually, the bulk of the abandonments in any year is comprised of short branches that, for one reason or another, have outlived their usefulness. As might be expected, this class of lines was again prominent among the abandonments that occurred in 1942, as will be noted by reference to the detailed tabulation of abandonments for the year, which appears in another column. However, the effect of highway competition and the changed and changing requirements of traffic and of many of the communities served by these lines are reflected in the large number of longer lines and of entire railways that were abandoned during the year and which helped to swell the aggregate abandonments to their record mileage.

Historic Line Taken Up

The longest single abandonment was that of the Southern Pacific from Lucin, Utah, to Ogden, by way of Promontory Point, 141.96 miles, the latter being the place where the Union Pacific and the Central Pacific met in 1869 to form the first transcontinental railway route. The second largest abandonment occurred in Nebraska, this being the line of the Chicago & North Western between Hastings and David City, which was taken up from Hastings to Linwood, 102.62 miles. The line of the St. Louis-San Francisco between McNair, Ark., and Dills, Okla., 91.16 miles represented the third abandonment in order of magnitude. Fourth in this order was the Pacific Coast Railway, with 76.66 miles of lines abandoned. This road also bears the distinction of having been the largest abandonment of an entire railway, its tracks having been taken up between Los Alamos, Cal., and Port San Luis, and from Suey Junction, Cal., to Sisquoc.

The Cisco & Northeastern, a subsidiary of the Texas & Pacific, extending from Cisco, Tex., to Throckmorton,

Mileage Abandoned 1932 to 1942, Inclusive

	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	Total
Alaska	....	18.27	....	....	....	3.00	195.20	....	....	....	....	216.47
Alabama	20.82	28.08	36.22	....	42.09	9.95	1.64	21.96	20.40	68.09	23.44	272.69
Arizona	....	126.51	15.49	17.04	....	....	16.00	8.49	8.73	0.92	4.20	197.38
Arkansas	8.17	37.85	51.28	42.35	23.95	83.43	51.10	5.59	51.39	53.01	47.06	455.18
California	0.77	185.65	116.00	70.57	30.57	74.23	34.27	37.71	148.72	36.32	224.51	959.32
Colorado	26.39	56.57	6.31	84.98	86.30	231.46	26.29	77.43	....	12.74	68.69	677.16
Connecticut	....	....	....	33.93	....	25.31	50.25	....	16.88	1.17	2.21	129.75
Delaware	....	....	....	....	33.16	....	3.07	....	0.88	....	....	37.11
Florida	70.09	69.59	28.13	1.47	165.22	....	12.00	40.91	....	52.81	102.80	543.02
Georgia	66.41	46.56	126.63	12.34	....	....	85.26	39.70	0.99	87.41	19.69	484.99
Idaho	15.41	....	4.63	46.78	16.00	....	....	84.52	....	11.60	25.50	204.44
Illinois	54.83	38.30	160.82	13.90	32.06	87.42	29.41	57.14	26.25	90.45	70.59	661.17
Indiana	14.80	25.66	....	69.70	0.12	....	....	....	5.23	....	22.00	137.51
Iowa	53.12	79.51	52.44	83.32	208.75	14.44	120.58	55.88	90.01	14.10	29.42	801.57
Kansas	....	128.97	162.64	236.85	51.33	21.04	....	50.73	....	99.47	69.09	820.12
Kentucky	78.17	74.27	22.89	7.86	....	12.81	14.58	2.74	18.00	95.98	57.44	384.74
Louisiana	45.35	35.94	37.48	8.96	6.50	11.46	60.67	28.22	71.42	....	35.40	341.40
Maine	8.50	13.95	71.39	8.16	....	35.97	12.84	....	....	15.92	8.83	175.56
Maryland	1.00	....	....	25.60	....	3.75	20.23	13.29	....	7.50	1.33	72.70
Massachusetts	1.40	....	....	33.37	....	33.26	21.82	67.52	51.48	3.08	45.57	257.50
Michigan	201.99	51.05	71.39	166.20	40.16	64.65	116.65	8.14	16.99	62.83	74.85	874.90
Minnesota	91.07	12.94	53.37	50.93	31.94	23.18	32.91	....	42.28	52.15	0.19	390.96
Mississippi	24.10	33.50	85.57	....	....	....	....	37.45	15.48	42.44	24.57	263.11
Missouri	53.17	25.51	202.65	118.98	48.47	....	91.48	256.51	59.11	58.57	73.33	987.78
Montana	3.80	....	....	18.37	10.31	29.28	....	41.73	....	3.52	....	107.01
Nebraska	15.21	45.39	4.87	....	....	....	14.66	44.29	46.50	18.76	144.94	334.62
Nevada	....	....	26.27	0.31	....	....	214.71	2.20	31.30	....	32.50	307.29
New Hampshire	25.46	....	5.90	63.92	28.61	16.99	28.40	12.18	2.45	....	37.56	221.47
New Jersey	....	62.58	21.38	....	60.57	6.32	1.14	3.46	18.84	19.27	10.06	203.62
New Mexico	....	....	41.10	48.02	....	....	....	18.76	....	118.79	43.33	270.00
New York	58.32	4.14	30.82	30.58	57.00	29.33	201.12	51.19	60.69	0.36	58.94	582.49
North Carolina	22.24	53.10	18.50	10.00	11.39	25.17	53.82	....	62.34	31.57	1.23	289.36
North Dakota	....	....	....	....	16.36	....	3.56	....	....	....	....	19.92
Ohio	35.43	17.81	....	18.77	66.47	24.08	3.16	26.04	3.95	11.73	33.11	240.55
Oklahoma	....	9.24	79.01	....	8.60	15.95	108.87	222.97	11.39	16.95	144.47	617.45
Oregon	25.92	12.31	7.75	13.00	133.17	....	0.15	17.01	20.40	28.99	....	258.70
Pennsylvania	29.75	39.33	77.60	58.64	105.37	33.58	86.63	65.94	51.34	41.49	153.30	742.97
Rhode Island	....	....	....	....	....	16.33	0.58	0.48	....	....	....	17.39
South Carolina	44.05	....	1.54	76.50	25.00	15.80	8.60	13.50	24.97	84.66	32.57	327.19
South Dakota	....	....	24.04	26.65	16.43	....	23.33	....	120.98	14.05	4.23	229.71
Tennessee	74.01	39.81	41.23	64.15	54.84	47.94	2.60	53.44	20.49	45.87	36.23	480.61
Texas	107.10	188.82	126.13	77.81	39.12	44.63	23.96	118.83	75.16	123.60	339.46	1264.63
Utah	19.71	3.05	16.19	....	....	6.88	14.70	66.03	....	....	165.72	292.28
Vermont	....	33.22	....	....	1.00	8.75	26.38	3.87	....	....	....	73.22
Virginia	112.89	51.69	4.80	21.74	....	4.45	47.46	0.66	38.55	1.96	99.75	383.95
Washington	16.36	55.86	12.01	88.35	12.69	10.44	30.10	8.83	13.20	43.30	6.35	297.49
West Virginia	1.36	77.49	26.08	12.13	21.10	8.85	....	14.29	29.69	16.77	59.02	266.78
Wisconsin	24.90	93.14	124.45	39.65	38.18	59.47	6.78	103.40	22.80	20.62	82.89	616.28
Wyoming	....	....	....	41.07	....	....	....	....	....	....	....	41.07
Total	1,452.07	1,875.66	1,995.00	1,842.95	1,522.84	1,139.60	1,896.96	1,783.03	1,299.28	1,508.82	2,516.37	18,832.58

Lines Abandoned in the United States, Canada and Mexico in 1942

United States	Lines abandoned and taken up miles	Lines abandoned but not yet taken up miles
Atchison, Topeka & Santa Fe		
Purcell, Okla., to Chickasha	41.70	....
Marland, Okla., to Lio	9.90	....
Florence, Kan., to El Dorado	27.50	....
Kiowa, Kan., to Gerlane	.....	9.90
Raton, N. M., to Sugarite	....	5.80
Atlantic Coast Line		
Altoona, Fla., to Ashton	17.15	....
At Yalaha, Fla.	0.80	....
At Ferguson, S. C.	2.14	....
Baltimore & Ohio		
Bendale, W. Va., to Burnsville	23.40	....
Staunton, Va., to Lexington	....	35.40
Mt. Jewett, Pa., to Kushiqua	....	4.11
Bangor & Aroostook		
Mile Post K-3.73, Me., to M.P. K-3.91	0.18	....
Mile Post E-7.73, Me., to M.P. E-8	0.27	....
Mile Post K-3.91, Me., to M.P. K-4.50	....	0.59
Boston & Maine		
Jewett, Me., to Foundry, N. H.	5.24	....
Sawyers, N. H., to Dover Point	3.34	....
Hollis, N. H., to Nashua	4.63	....
Nashua, N. H., to Hudson	2.14	....
At Epping, N. H.	1.30	....
Topsfield, Mass., to Newburyport	15.41	....
Georgetown, Mass., to Paper Mill Station	4.60	....
Franklin Junction, N. H., to Tilton	1.13	....
Squanacook Junction, Mass., to Pepperell	6.35	....
South Milford, N. H., to Milford	1.49	....
Peterborough, N. H., to Elmwood	....	6.52
Hillsboro, N. H., to Emerson	....	4.64
Farmington, N. H., to Alton	....	9.13
Burlington-Rock Island		
Mexia, Tex., to Hubbard	22.53	....
California Western Railroad and Navigation Company		
Glen Blair Junction, Cal., to Glen Blair	3.20	....
Carolina Western		
Halls, S. C., to Russellville	1.50	....
Chesapeake & Ohio		
Myrtle, W. Va., to Vass	1.48	....
Lorado, W. Va., to Three Forks	2.75	....
Sharples, W. Va., to end of ilne	1.38	....
Colcord, W. Va., to end of line	1.45	....
Blair, W. Va., to Sovereign	1.53	....
Glen Jean, W. Va., to Sugar Creek Junction	3.29	....
Emmett, W. Va., to end of line	4.21	....
Clothier, W. Va., to Selbe	5.14	....
Jacks Creek, Ky., to end of line	1.44	....
Irene, W. Va., to Ivaton	1.67	....
Garrett, Ky., to end of line	1.24	....
Sutton, Ky., to Greasy Creek	2.57	....
Weeksbury, Ky., to end of line	1.36	....
Lane Siding (Gibson), Ky., to end of line	1.19	....
Coaldale Junction, Ky., to Coaldale	1.55	....
Chicago & Eastern Illinois		
Momence, Ill., to State line	11.02	....
Chicago & North Western		
Linwood, Neb., to Hastings	102.62	....
Sycamore, Ill., to Caledonia	27.91	....
Koepenick, Wis., to Pearson	8.68	....
Hiles Junction, Wis., to Hiles	9.13	....
Strawbridge, Wis., to Benton	2.56	....
Clintonville, Wis., to Embarrass	....	5.26
Deadwood, S. D., to Lead	....	4.23
Chicago, Burlington & Quincy		
South Gifford, Mo., to end of line	7.10	....
Superior, Neb., to Nelson	12.95	....
Salem, Neb., to Shubert	10.87	....
Benedict, Neb., to Stromsburg	7.10	....
Chester, Neb., to Hebron	11.40	....
Chicago, Rock Island & Pacific		
Altamont, Mo., to Cameron Junction	14.26	....
Tecumseh Junction, Okla., to Asher	25.18	....
Wiville, Ark., to Gregory	5.98	....
At Mercer, Mo., and Mill Grove	1.56	....
Jacksboro, Tex., to Seymour	....	75.08
Mercer, Mo., to Mill Grove	....	14.82
Cisco & Northeastern		
Cisco, Tex., to Throckmorton	65.44	....
Cleveland, Cincinnati, Chicago, & St. Louis		
Niles, Mich., to Goshen, Ind.	28.50	....
Clinchfield		
Carbo, Va., to Wilder	....	8.40
Hurricane Junction, Va., to end of line	....	1.20
Colorado & Southern		
Chatfield, Colo., to South Platte	15.60	....
Denver, Colo., to Golden	0.35	....
Crystal River & San Juan		
Marble, Colo., to Placita	7.32	....
Placita, Colo., to Carbondale	20.66	....
Danville & Western		
Fieldale, Va., to Stuart	26.50	....
Delaware & Hudson		
At Plymouth, Pa.	1.22	....
Delaware & Northern		
East Branch, N. Y., to Arkville	37.30	....
Denver & Rio Grande Western		
Alamo No. 1 Mine, Colo., to end of Loma branch	0.90	....
Villa Grove, Colo., to Orient	8.06	....
Salina, Utah, to Crystal	17.67	....
Erie		
Stony Point Junction, N. Y., to Haverstraw	....	2.14
State Line Junction, N. Y., to New York-Pennsylvania State line	....	6.50
New York-Pennsylvania State line to Tioga Junction, Pa.	....	13.50
Fredericksburg & Northern		
Fredericksburg, Tex., to Fredericksburg Junction	23.90	....

United States	Lines abandoned and taken up miles	Lines abandoned but not yet taken up miles
Green County		
Apalachee, Ga., to Monroe	19.69	....
Greenville & Northern		
Cleveland, S. C., to River Falls	3.97	....
Gulf Coast Lines		
Rio Hondo, Tex., to Leona	9.34	....
Boulevard Junction, Tex., to Ohio Junction	6.42	....
La Paloma, Tex., to Santander	5.93	....
Monte Christo, Tex., to East	1.72	....
Gulf, Colorado & Sante Fe		
High Island, Tex., to Port Bolivar	26.70	....
Illinois Central		
Stookey, Ill., to Stolle	8.41	....
Red Oak, Ill., to Dodgeville, Wis.	57.36	....
Anthon, Iowa, to Onawa	29.42	....
Kansas City Southern		
Bear Creek Junction, Ark., to Horatio	5.59	....
Lakeside & Marblehead		
Marblehead, Ohio, to Bay Point	2.31	....
Laona & Northern		
Snyders, Wis., to end of Silver Lake branch	8.90	....
Lehigh Valley		
Oneida, Pa., to Sheppton	1.53	....
At Bernice, Pa.	0.20	....
Lime Rock		
At Rockland, Me.	5.79	....
Live Oak, Perry & Gulf		
Scanlon, Fla., to Mile Post 58	6.00	....
Mile Post 58 to Perry, Fla.	....	12.00
Long Island		
Hempstead branch, Long Island, N. Y.	0.24	....
Louisville & Nashville		
Allingham, Tenn., to Harriman	16.60	....
Sheffield, Ala., to Tuscumbia	2.25	....
North Winchester, Ky., to Fincastle	46.25	....
Swan Creek Junction, Tenn., to Gordonsburg	15.37	....
Graves, Ala., to Redding	....	2.76
Como, Ky., to Madisonville	....	1.84
Michigan Central		
Owendale, Mich., to Bach	5.61	....
Minneapolis Eastern		
At Minneapolis, Minn.	0.19	....
Missouri Pacific		
At Arkansas City, Ark.	0.20	....
Delight, Ark., to Kraft Spur	4.29	....
Alfalfa Center, Mo., to Birds Point	1.97	....
Leroy, Kan., to Madison	30.10	....
At El Dorado, Kan.	0.26	....
At Roper, Kan.	0.98	....
Energy, Ill., to Hafer	1.43	....
East Carterville, Ill., to Marion	6.68	....
At Johnson City, Ill.	0.81	....
Connecting tracks, Herrin, Ill., and East Carterville	0.65	....
Marion, Ill., to New Bruce Mine	2.04	....
Pittsburg, Ill., to Paulton	2.14	....
Monongahela		
Shamrock Junction, Pa., to end of branch	1.37	....
Nashville, Chattanooga & St. Louis		
Orme Junction, Ala., to Orme, Tenn.	10.42	....
Nevada Copper Belt		
Hudson, Nev., to Ludwig	9.00	....
Thompson, Nev., to Wabuska	2.50	....
Nevada County Narrow Gage		
Colfax, Cal., to Nevada City	20.65	....
New York Central		
Poland, N. Y., to Prospect Junction	8.50	....
Gorham Mine, Pa., to Wilgus	3.10	....
Edison, Ohio, to Mt. Gilead Junction	1.20	....
New York, New Haven & Hartford		
Orange, Conn., to Derby Junction	2.21	....
Adamsdale Junction, Mass., to Franklin Junction	11.19	....
Bellingham Junction, Mass., to Caryville	2.92	....
Randolph, Mass., to Stoughton Junction	5.10	....
New York, Susquehanna & Western		
Hainesburg Junction, N. J., to Stroudsburg, Pa.	11.80	....
Norfolk & Western		
Lick Fork, W. Va., to end of branch	3.00	....
Shrewsbury Spur Junction, to end of Widemouth branch	0.76	....
Blackford, Va., to end of Honaker branch	0.04	....
Womack, Va.	0.01	....
Allisonia, Va., to end of Reed Island branch	12.24	....
Norcross, Va., to end of Potts Valley branch	0.57	....
Bastian, Va., to end of Narrows branch	4.16	....
Hanging Rock, Va., to end of Catawba branch	4.97	....
Northern Pacific		
Carbonado, Wash., to Fairfax	....	6.23
Northwestern Pacific		
Sonoma, Cal., to Glen Ellen	6.60	....
Larkspur, Cal., to San Anselmo	2.90	....
Fairfax, Cal., to Manor	0.73	....
Pacific Coast Railway		
Los Alamos, Cal., to Port San Luis	63.95	....
Suey Junction, Cal., to Sisquoc	12.71	....
Pennsylvania		
Phoenixville branch, Pa.	0.03	....
Shamrock branch, Pa., to end	1.37	....
Alexandria branch, Pa., to end	3.26	....
Dundale branch, Pa., to end	0.32	....
Coshocton, Ohio, to Warsaw Junction	....	8.30
Trinway, Ohio, to Blissfield	....	21.30
Pennsylvania—Reading Seashore Lines		
At Haddonfield, N. J.	0.41	....
Alloway Junction, N. J., to Quinton	4.22	....
Atco, N. J., to Williamstown Junction	....	2.43

Lines Abandoned in the United States, Canada and Mexico in 1942 (*Continued*)

United States	Lines abandoned and taken up miles	Lines abandoned but not yet taken up miles
Pere Marquette		
Warden, Mich., to Kidd	11.90	....
Tappan, Mich., to Almont	30.06	....
Paw Paw, Mich., to Lawton	3.14	....
North Greenville, Mich., to Howard City	....	17.64
Pittsburgh & Lake Erie		
Elwell branch, Youghiogheny, Pa.	0.55	....
West Youghiogheny branch, Pa.	0.04	....
Pittsburgh, Chartiers & Youghiogheny		
Presto, Pa., to Beechmont	2.60	....
Borland, Pa., to Beadling	1.30	....
Raleigh & Charleston		
Lakeview, S. C., to South Marion	19.91	....
Reading		
Gettysburg, Pa., to Round Top	2.50	....
Westwood Switch, Pa., to Minersville	1.26	....
At Brockville, Pa.	0.20	....
Richardson, Pa., branch	1.34	....
Otto No. 2 Colliery branch, Pa.	0.87	....
Swatara, Pa., branch	0.58	....
John Veith Colliery branch, Pa.	0.65	....
Phoenix Park, Pa., Colliery branch	0.69	....
Ashland, Pa., branch	1.13	....
Glen Dower, Pa., branch	0.65	....
Auchenbach, Pa., to Pine Grove	1.58	....
Rio Grande & Eagle Pass		
Gardner Siding, Tex., to Darwin	2.90	....
Rockingham		
At Ledbetter, N. C.	1.23	....
Roscoe Snyder & Pacific		
Snyder, Tex., to Fluvanna	17.75	....
St. Louis & Hannibal		
Ralls Junction, Mo., to Perry	17.80	....
St. Louis-San Francisco		
McNair, Ark., to Dills, Okla.	91.16	....
At Caruthersville, Mo.	0.49	....
San Diego & Arizona Eastern		
El Cajon, Cal., to Santee	3.22	....
Santa Fe Northwestern		
West Bernalillo, N. M., to Gilman	37.10	....
Schoharie Valley		
Schoharie Junction, N. Y., to Schoharie	4.26	....
Seaboard Air Line		
At Inverness, Fla.	0.22	....
Punta Rassa, Fla., to end of line	1.72	....
At Yonges Island, S. C.	1.55	....
Chisholm, S. C., to Lancett	3.50	....
Wattsville, Ala., to Pell City	8.01	....
Turkey Creek, Fla., to Durant	5.30	....
Carrabelle, Fla., to Tallahassee	....	48.38
Quincy, Fla., to Havana	....	11.23
Sheffield & Tionesta		
Nebraska, Pa., to Buck Mills	12.47	....
Sibley, Lake Bisteneau & Southern		
Sibley, La., to Halls Summit	27.50	....
Silverton Northern		
Eureka, Colo., to Silverton	15.80	....
Southern		
Harriman, Tenn., to De Armond	4.26	....
Southern Pacific		
Montpelier, Cal., to Merced	21.10	....
Berenda, Cal., to Raymond	9.20	....
Knowles Junction, Cal., to Knowles	2.40	....
Tonopah Junction, Cal., to Betnon	49.70	....
Lucin, Utah, to Ogden	141.96	....
Hollister, Cal., to Tres Pinas	5.44	....
Folsom street, San Francisco, Cal., to Miguel street	1.57	....
Alhambra, Cal., to Duarte	10.04	....
At Riverside, Cal.	0.21	....
Wiebling, Cal., to Wintersburg	1.10	....
Studebaker, Cal., to Whittier	5.29	....
Crafton, Cal., to Greenspot	1.79	....
Tucson, Ariz., to South Yard Junction	4.20	....
Lawrence, N. M., to Valedon	0.43	....
Fournet, La., to Cleon	2.20	....
Cade, La., to St. Martinville	5.70	....
Glidden, Tex., to La Grange	24.43	....
Ennis, Tex., to Kaufman	27.35	....
Susquehanna & New York		
Towanda, Pa., to Marsh Hill Junction	46.44	....
Texas & Pacific		
Mingus, Tex., to Thurber	2.85	....
Tionesta Valley		
Sheffield, Pa., to Sheffield Junction	12.58	....
Union Pacific		
Ballard Junction, Utah, to Benson	2.95	....
Evona branch, Utah	1.16	....
Benning, Idaho, to Idahome	17.19	....
Bradford, Utah, to Bear River	0.74	....
Thatcher, Utah, to Nelson	1.24	....
Peterson, Idaho, to Gardner	3.90	....
Detroit, Kan., to Enterprise	0.35	....
At Langdon, Wash.	0.12	....
Sugar City, Idaho, to Hinckley	4.41	....
Venturi County		
Round Mountain Junction, Cal., to Nauman	2.71	....
Virginia & Truckee		
Carson City, Nev., to Virginia City	21.00	....
Virginian		
Fireco, Va., to Douglas Coal Mine	1.26	....
Wabash		
Salisbury, Mo., to Glascow	15.33	....
At Sullivan, Ill.	0.50	....
Western Allegheny		
West Pittsburgh, Pa., to Mercer Road	24.00	....
Mercer Road, Pa., to Queen Junction	....	3.06
Western Maryland		
Koontz Junction, Md., to Koontz	0.94	....
Jackson, W. Va., branch M.P. 3 to end	1.20	....
Peora, W. Va., to Wyatt	2.35	....
Thomas, W. Va., to Davis	5.41	....
McCoole, Md., to Keyser	0.39	....
Wichita Valley		
Waurika, Okla., to Red river	7.53	....
Wichita Falls, Tex., to Red river	....	27.12
Winchester & Western		
Gore, Va., to Rock Enon	5.00	....
Yazoo & Mississippi Valley		
Rosedale, Miss., to Boyle	24.57	....
	2146.86	369.51
Canada		
Canadian Pacific		
Rigaud, Que., to Pointe Fortune	6.81	....
Eastman, Que., to Peasleys	6.82	....
Kingsbury, Que., to Windsor Mills	9.40	....
	23.03	
Mexico	Kilometers	
Mexico North Western		
San Antonio, Chihuahua, to Cusihuiriachic	21.00	....

65.44 miles, was the second largest abandonment of an entire line. The Susquehanna & New York ranks third in this respect, having abandoned its entire line between Towanda, Pa., and Marsh Hill Junction, 46.44 miles, while its companion road, the Tionesta Valley, has also taken up its entire line between Sheffield Junction, Pa., and Sheffield, 12.58 miles. The Delaware & Northern stood fourth on the list of complete abandonments, with 37.30 miles taken up between East Branch, N. Y., and Arkville.

Fourteen Roads Cease to Exist

It is significant that 14 entire railways were abandoned last year, this being the same number as were abandoned in 1941. In 1940 and 1939, 13 and 17 entire roads were abandoned during these respective years, a total of 58 and an average of approximately 15 for each of these four years. The abandonment of several other lines is now under consideration, with the probability that some of them will pass out of existence during 1943. The abandonments reported in any year include all lines abandoned permanently during the year, regardless of whether the tracks have been taken up at the end of the year, and are not included in later years when the tracks are actually taken up. However, in 1942, the demand for all classes of released rail was so insistent that all but 370 miles of the record-breaking abandonments for that year had been taken up. In the main, this latter mileage represented lines for which permission to abandon had been received too late to permit the removal of the rails prior to the end of the year.

Prior to 1917, abandonments were not recorded, for while lines had been abandoned from time to time, the cases were few and far between and the abandoned lines were generally unimportant and usually located in sparsely populated sections. In most cases they were logging roads or served mines, and the abandonments occurred so sporadically that they attracted little attention. Beginning with 1917, however, in which year 942 miles of main lines were abandoned, largely stimulated, as today, by war needs, abandonments have continued on a large scale, the total mileage abandoned in

(*Continued on page 116*)

Freight Car Orders Were Curtailed by Deliveries in 1942

Large backlog at beginning of year plus government restricted building programs held down new buying

By Arthur J. McGinnis

Associate Editor

RAILROAD purchasing of new freight cars during 1942 was limited by the large backlog of cars on order at the beginning of the year and by the government's assumption of control over the production and distribution of new railroad equipment on April 4.

On January 1, 1942, unfilled orders for domestic service totaled 80,724 freight cars, of which 52,773 were placed with contract car builders and 27,951 with the railroads' own shops. With deliveries severely restricted by materials shortages, principally of steel, this backlog made early delivery dates for newly-ordered equipment unavailable.

Table I—Freight Car Orders for Domestic Service in 1942

Builders	Railroads	Industrial and Private Car Cos.	Total	Per Cent of Total
Company Shops	3,035	156	3,191	12
Contract Car Builders	19,272	4,367	23,639	88
Total	22,307	4,523	26,830	100

Note.—Orders by U. S. Government departments are excluded.

Effective with the War Production Board's limitation order of April 4, the board's authorization was required for the construction and delivery of new cars. To the 36,000 car-building program authorized in January by the former Supply, Priorities and Allocations Board (which was supplanted in that month by the WPB) for construction during the three months, February-April, inclusive, the WPB on April 8 added but 18,000 for construction during the remaining eight months of the year.

Limited by the WPB as to the number of freight cars that could be acquired and as to which railroads could acquire the cars, the volume of orders placed by the carriers in 1942 reflects the size of the government's building programs and the extent of its control rather than the pent-up demand or needs of the carriers' transportation systems.

Orders placed during 1942 for domestic service totaled 26,830 cars, of which 22,307 were placed by the railroads and 4,523 by industrial companies and private car lines. Railroad orders were divided 3,035, or 14 per cent to company shops and 19,272, or 86 per cent to contract car builders. Two private car lines ordered 156 cars from their own shops with the remaining 4,367 cars placed with contract builders.

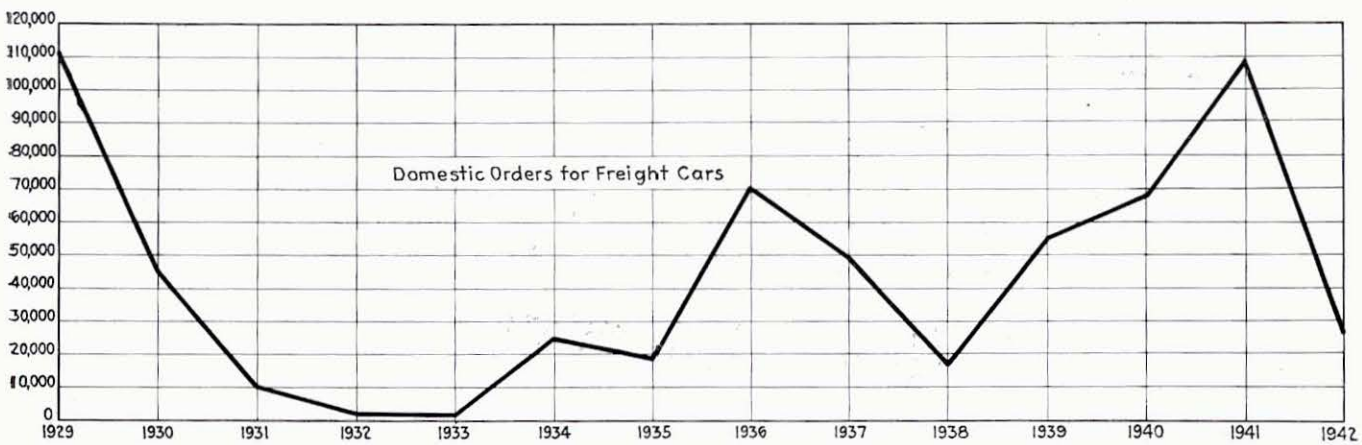
Table II—Domestic Car Orders by Type and Purchaser

Type of Freight Car Ordered	Railroads		Industrial and Private Car Cos.		Total Orders	
	1942	1941	1942	1941	1942	1941
Box	3,274	58,235	197	331	3,471	58,566
Hopper	10,868	25,670	1,158	627	12,026	26,297
Gondola	6,535	13,951	371	530	6,906	14,481
Flat	1,464	3,086	43	233	1,507	3,319
Refrigerator	....	200	750	2,650	750	2,850
Tank	10	460	1,724	1,428	1,734	1,888
Stock	....	300	....	....	....	300
Caboose	156	1,232	....	3	156	1,235
Air Dump	....	379	280	294	280	673
Total	22,307	103,513	4,523	6,096	26,830	109,609

Note.—1941 totals are adjusted to eliminate orders subsequently cancelled in 1942 due to WPB restrictions on building.

Because of the war, the *Railway Age* is not permitted to publish the number of cars ordered or built for U. S. Government departments either for domestic service or export, and, for comparative purposes, government orders have also been excluded from 1941 totals in Tables I, II, and III.

The manner in which the small government-authorized



building programs stifled new purchasing by the railroads is evident in a monthly analysis of orders placed. Of the 22,307 cars ordered by the railroads, 15,499 or 70 per cent of the total were ordered during the first three months of the year before the government's April 4 "freezing" order, 1,522 in April and 2,284 in May. During the remaining months of the year, despite the carriers' pressing current and anticipated needs for additional rolling stock, new buying virtually ceased. The

Table III—Total Orders For Freight Cars 1929-1942

Year	Domestic	U. S. Export	Total U. S.	Canadian
1942	26,830	1,878	28,708	1,637*
1941	109,609	2,985	112,345	7,578*
1940	67,852	1,774	69,626	936
1939	54,441	1,476	55,917	7,007*
1938	16,647	442	17,089	4,902
1937	49,331	1,369	50,700	7,397
1936	70,842	526	71,368	271
1935	18,708	110	18,818	2,421
1934	24,610	1,323	25,933	12
1933	1,686	132	1,818	75
1932	1,968	77	2,045	501
1931	10,826	151	10,977	3,807
1930	45,731	1,200	46,931	1,936
1929	111,321	3,023	114,344	9,899

* (Includes Canadian export orders.)

Note:—The totals of domestic and U. S. export orders for years 1942 and 1941 exclude U. S. Government purchases. Domestic orders placed in 1941 are adjusted to eliminate orders subsequently cancelled in 1942 due to WPB restrictions on building. In certain instances domestic orders placed in December are not reported until following year; statistics for years 1929-1941 are adjusted to eliminate this overlap.

3,002 cars ordered during the final seven months were placed as follows: 25 in June, 450 in July, 2,100 in August, 145 in September, none in October, 197 in November, and 85 in December. The 2,100 ordered in August originated chiefly from two railroads, comprising 1,050 gondola cars by the Denver & Rio Grande Western (of which 780 were authorized) and 1,000 gondola cars (authorized) by the Union Pacific, which latter road had ordered its its cars earlier in the year and subsequently suspended the order, pending a WPB decision as to their building.

WPB Authorized 7,007 Cars for Building

Of the 22,307 cars ordered by the railroads, 7,007 or 31 per cent were authorized for building by the War Production Board and 15,300 or 69 per cent were without WPB authority to build at the year-end. Of the 4,523 ordered by industrial companies and private car lines, 23 were delivered prior to April 4 and required no WPB release, 2,800 were released and 1,700 are "frozen."

Evidencing the need for open-top cars, 1942 orders by the railroads were chiefly for hopper and gondola cars, rather than box cars, as in 1941. Totals of 10,868 hopper and 6,535 gondola cars were purchased during the year, or 78 per cent of all orders placed by the carriers. Industrial companies and private car lines sought chiefly tank cars with hopper cars next in demand.

An analysis of 1942 domestic freight car orders by railroads and industrial companies and private car lines according to the class of car ordered is shown in Table II. Because car deliveries were subject to government control for most of the year and orders limited thereby, and because certain of the cars ordered in 1942 and still on order from 1941 placements may not be released for building and may be subsequently cancelled during 1943, a comparison of the volume of cars ordered and built in 1942 with the number ordered and built in preceding years is not of the usual value, although this comparison is set forth in Tables II, III, and IV, for such significance as may be noted therein.

Leading freight car orders placed by railroads, with the number and type authorized for building by the War Production Board shown in parenthesis, included the following: 1,100 box, 500 hopper, 700 gondola and 172 flat cars (300 gondola and 172 flat authorized) by the Atlantic Coast Line; 1,000 box, 1,025 hopper and 10 tank cars (10 tank authorized) by the Baltimore & Ohio; 502 box, 1,000 gondola and 275 flat cars (275 flat authorized) by the Chicago & North Western; 1,500 gondola cars (780 authorized) by the Denver & Rio Grande Western; 2,000 ore cars (1,500 authorized) by the Duluth, Missabe & Iron Range; 1,000 ore and 12 caboose cars (500 ore and 12 caboose authorized) by the Great Northern; 1,100 gondola and 303 flat cars (all authorized) by the New York Central; 1,000 hopper cars (none authorized) by the Reading; 2,506 hopper and 1,000 gondola cars (none authorized) by the Southern; and 1,000 ballast and 1,000 gondola cars (1,000 gondola authorized) by the Union Pacific.

Leading purchases by private car lines included 35 hopper, 96 gondola and 6 flat cars (35 hopper, 86 gondola, 6 flat authorized) by the Carnegie-Illinois Steel Corporation 113 tank cars (9 delivered before April 4—101 authorized) by E. I. duPont de Nemours & Co.; 750 refrigerator cars (none authorized) by the Pacific Fruit Express; 140 air dump and 6 flat cars (all authorized) by the Phelps Dodge Corporation; 8 box, 256 hopper, 177 gondola and 16 air dump cars (8 box, 81 hopper, 57 gondola and 16 air dump authorized) by the Republic Steel Corporation; 22 hopper, 834 tank and 2 flat cars (all authorized) by the Shippers Car Line; and 100 gondola and 25 air dump cars (all authorized) by the Utah Copper Company.

Other domestic and export orders and Canadian orders are shown in detail in the appended tables which give the number, class, capacity, length, construction, weight,

Table IV—Freight Cars Built 1929-1942

Year	Domestic	U. S. Export	Total U. S.	Canadian
1942	59,571[1]	4,908[2]	64,479	867
1941	79,396	2,312	81,708	5,135[3]
1940	52,929	1,622	54,551	2,052
1939	24,876	181	25,057	2,206[3]
1938	17,473	549	18,022	5,115[3]
1937	75,003	1,121	76,124	6,595
1936	45,822	493	46,315	1,800
1935	6,933	888	7,821	801
1934	25,176	151	25,327	....
1933	2,160	151	2,311	550
1932	3,254	82	3,336	....
1931	13,205	409	13,614	4,633
1930	75,188	1,909	77,097	6,923
1929	82,240	3,168	85,408	8,557

[1] Excludes cars built for U. S. Government departments.
[2] Excludes U. S. Government and Lend-Lease orders.
[3] Includes export deliveries.

date of order, date of delivery and builder of the cars, and indicate whether or not building of the cars was authorized by the WPB.

Many 1941 Orders Were Cancelled in 1942

Domestic orders placed in 1941 are adjusted in the tables to eliminate orders subsequently cancelled in 1942 due to WPB restrictions on building. Principal cancellations of 1941 orders reported to the *Railway Age*, all of which were on order with the respective railroads' own shops, included the following: 1,400 box (original order—1,500) and 25 caboose cars by the Chicago, Milwaukee, St. Paul & Pacific; 1,000 box cars by the Great Northern; 1,000 box and 500 gondola cars by the Indiana Harbor Belt and 1,927 box cars (original order—3,000) by the New York Central (ordered from Des-

patch Shops); 1,107 box, 2,289 hopper, 1,000 gondola and 50 caboose cars (original order—2,000 box, 3,000 hopper, 1,000 gondola, 50 caboose) by the Pennsylvania; and 1,251 box (original order—2,000) by the Union Pacific.

Foreign purchases placed with American builders totaled 1,878 cars, a decrease of 1,107 under the number ordered for export in the preceding year. Cars for Mexico comprised the majority of these with the Mexican Government ordering 520 box, 200 gondola and 70 air dump cars, of which only the 200 gondolas were authorized for building, and the National Railways of Mexico ordering 500 box and 200 tank cars, of which only 50 tank cars were authorized.

Canadian orders numbered 1,637 cars, divided 1,305 for local service and 332 for export. Purchase by the Canadian Pacific of 930 cars, including 750 box, 150 ore and 30 caboose cars comprised the bulk of local orders. The Canadian National ordered 50 box-baggage cars. This compares with 1,025 cars ordered by the Canadian Pacific and 4,025 by the Canadian National in 1941. Chief Canadian export order was for 252 quarry-dump cars ordered by the Aluminum Company.

A comparison of 1942 domestic, export and Canadian orders with the preceding years, 1929-1941, inclusive, is set forth in Table III.

Domestic Freight Cars Built Numbered 59,571

Freight cars built during 1942 for domestic service, exclusive of cars delivered to U. S. Government departments, totaled 59,571. Of these, 44,317 or 74 per cent were constructed by contract car builders, 14,753 or 25 per cent by railroad companies' shops and 501 by private car lines, which latter number included 435 refrigerator cars authorized for construction by the WPB but not allocated from its regular program. (December deliveries included in these figures are partially estimated). This compares with 54,000 authorized by the government for the final 11 months of the year (36,000 by SPAB for February-April, inclusive, and 18,000 by WPB for May-December, inclusive) of which number there will be an estimated carry-over of several thousand undelivered cars into 1943. There was no government-set building program in effect during January.

Production during the year began with deliveries of about 8,000 cars in January, and mounted, as builders worked on the SPAB program, to a peak of about 10,000 delivered in April, and subsequently fell off rapidly to a monthly average of about 2,100 cars delivered during the final six months. The decline in deliveries during these latter months was particularly severe in railroad shops.

In addition, there were 4,908 cars built in the United States for export, exclusive of lend-lease and government orders. Canadian deliveries numbered 867 cars for local service, which compares with 5,135 delivered in 1941, of which 3,045 were for local service and 2,090 for export. A comparison of 1942 car deliveries with other years in the 1929-1942 cycle is set forth in Table IV.

On November 19, the War Production Board announced a new building program of 20,000 freight cars for the first six months of 1943 and it is expected that these cars will be allocated principally from the 15,300 cars ordered in 1942 which were without WPB authority to build at the year-end, in part for 1941 orders that remain unfilled and unauthorized and in part from a limited number of new purchases.

Production figures as used in the preceding review are not comparable with figures on the number of cars *installed* as reported in statistics issued by the A. A. R. as these latter include, in addition to new units acquired, cars rebuilt and re-written into property accounts; used units acquired; leased units returned to service; and new and used units leased from others.

The appended tables contain a detailed statement of domestic orders for new freight cars, or those having new bodies placed during 1942 by railroads, industrial companies and private car lines; also, those placed for export and in Canada. As indicated by a footnote in the tables, information as to whether or not cars were authorized for building by the War Production Board is shown in "Date of Delivery" column. Cars delivered prior to April, 1942, required no WPB authorization. Cars delivered subsequent to April, 1942, or shown as scheduled for delivery in 1943, have been authorized. Cars ordered but without WPB authority to build are marked with an asterisk (*). Where no date or asterisk is shown, cars are authorized, but definite delivery date has not been set.

The list of orders was compiled from information furnished to the *Railway Age* by the railroads, private car lines, and other purchasers of cars in response to requests for this information. Data thus compiled were then checked against lists of orders supplied by the car builders. Production figures were secured in response to requests to the freight car builders. As in former years, the *Railway Age* is especially indebted to the American Railway Car Institute for its assistance in making available reports of the companies affiliated with that organization.

The *Railway Age* cannot guarantee the listing of orders to be complete or the statistical accuracy of the production figures. However, it is believed that such omissions as occur will be found to be relatively small and unimportant, and will not vitiate the value of the figures, particularly with respect to comparisons with preceding years.

Freight Car Orders in 1942

For Service in the United States

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
American Steel Foundries	12	Air Dump	140,000	..	..	Steel	.....	1942	September	Austin-Western
American Steel & Wire Co.	30	Ore	150,000	19	10⅞	Steel	42,500	August	December	Amer. Car & Fdy.
(for Defense Plant Corp.)	8	Air Dump	100,000	..	..	Steel	.....	1942	Jan. '43	Austin-Western
Anchor Petroleum Co.	20	Tank	10,500g	37	0	Steel	68,500	February	October	Amer. Car & Fdy.
Ann Arbor	50	Hopper	100,000	33	..	Composite	.....	November	*	Company Shops
Ansul Chemical Co.	1	Tank	60,000	..	..	Steel	.....	February	March	General American
Atlantic Coast Line	100	Hopper	140,000	35	9¾	Steel	.....	February	*	Bethlehem
	400	Hopper	100,000	33	0	Steel	43,000	February	*	Bethlehem
	300	Gondola	100,000	40	6⅝	Composite	41,000	February	Jan. '43	Bethlehem
	400	Gondola	100,000	40	6⅝	Composite	.....	February	*	Bethlehem
	1,100	S. S. Box	100,000	40	6	Steel	44,600	January	*	Pullman-Standard
	100	Flat	100,000	53	6	Steel	51,250	January	Jan. '43	Greenville
	72	Flat	100,000	53	6	Steel	51,250	May	Jan. '43	Greenville

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Atmospheric Nitrogen Co.	140	Tank	50,000	38	10¼	Steel	70,000	February	Jan. '43	Amer. Car & Fdy.
Badger, E. B., & Sons Co.	19	Tank	7,000g	..	..	Steel	.....	July	Dec.-Jan. '43	General American
	1	Tank	7,000g	..	..	Steel	.....	July	Feb. '43	General American
Baltimore & Ohio	1,025	Hopper	100,000	33	0	Steel	.....	March	*	Bethlehem
	1,000	Box	100,000	40	6	Steel	45,300	February	*	General American
	10	Tank	12,500g	..	..	Steel	.....	April	December	General American
Bessemer & Lake Erie	800	Hopper	180,000	40	8	Steel	49,200	May	*	Pullman-Standard
Brown Company	2	Tank	30,000	28	6	Steel	49,000	January	December	Amer. Car & Fdy.
Carnegie-Illinois Steel Corp.	35	Hopper	140,000	33	0	Steel	25,600	July	....	Pressed Steel
	2	L. S. Gondola	140,000	38	0	Steel	76,875	July	....	Pressed Steel
	10	Gondola	140,000	38	4	Steel	52,750	November	*	Pressed Steel
(Gary, Ind.)	80	Gondola	200,000	39	8⅛	Steel	118,000	August	December	Amer. Car & Fdy.
	4	D. E. Gondola	180,000	30	0	Steel	82,100	January	December	Greenville
	6	Flat	140,000	41	3	Steel	56,400	May	....	Greenville
Central of Georgia	100	D. S. Box	100,000	40	6	Steel	44,500	February	*	Amer. Car & Fdy.
	50	Hopper	100,000	33	0	Composite	41,400	February	*	Pullman-Standard
Chesapeake & Ohio	750†	Hopper	100,000	33	0⅛	Steel	40,200	Dec. '41	May	Amer. Car & Fdy.
	250†	Hopper	100,000	33	0⅛	Steel	40,200	Dec. '41	September	Amer. Car & Fdy.
Chicago & North Western	500	Gondola	100,000	41	6	Steel	.....	February	*	Bethlehem
	250	Flat	100,000	53	6	Steel	49,900	January	Oct.-Nov.	Pullman-Standard
	500	Gondola	140,000	41	6	Steel	49,000	January	*	General American
	477	Box	100,000	40	6	Steel	46,800	January	*	Amer. Car & Fdy.
	25	Box	100,000	40	6	Steel	49,000	January	*	Amer. Car & Fdy.
	25	Flat	140,000	52	1	Steel	57,900	June	August	Company Shops
Chicago, Indianapolis & Louisville	10	Ballast	100,000	33	4⅝	Steel	44,800	March	*	Amer. Car & Fdy.
Chicago, Milwaukee, St. Paul & Pacific	16	Flat	200,000	30	0	Steel	46,200	February	April	Company Shops
	2	Flat	200,000	30	0	Steel	46,700	March	April	Company Shops
Chicago, Rock Island & Pacific	350	S. S. Auto	100,000	50	6	Steel	58,241	February	*	Pressed Steel
	25	Cov. Hopper	140,000	29	3	Steel	53,500	February	*	General American
	300	Flat	100,000	53	6	Steel	50,500	February	Oct.-Feb. '43	Company Shops
Chicago, St. Paul, Minneapolis & Omaha	1	S. S. Box	100,000	40	6	Steel	.....	February	*	Amer. Car & Fdy.
Chicago, West Pullman & Southern	1	Caboose	.....	24	0	Steel	30,000	March	*	Company Shops
Chile Exploration Co.	50	Ore	140,000	23	0	Steel	57,031	August	....	Pressed Steel
Cities Service Corp. (for Defense Plant Corp.)	2	Tank	7,850g	33	1⅛	Steel	45,700	April	August	Amer. Car & Fdy.
	1	Tank	7,850g	33	1⅛	Steel	44,000	April	October	Amer. Car & Fdy.
Colorado & Wyoming	30	Ore	150,000	19	11	Steel	42,500	November	Feb. '43	Bethlehem
Columbia Steel Co. (for Defense Plant Corp.)	10	Gondola	100,000	45	0	Steel	45,069	July	....	Pressed Steel
	12	Hopper	100,000	33	0	Steel	41,586	July	....	Pressed Steel
	2	L. S. Gondola	140,000	38	0	Steel	76,875	August	....	Pressed Steel
Cramp Shipbuilding Co.	2	Tank	10,000g	34	11½	Steel	47,900	October	*	Amer. Car & Fdy.
Cumberland Gasoline Corp.	3	Tank	10,500g	37	0	Steel	67,000	January	May	Amer. Car & Fdy.
	2	Tank	10,500g	37	0	Steel	69,000	January	May	Amer. Car & Fdy.
Defense Plant Corp.	42	Tank	.....	..	..	Steel	.....	1942	*	General American
	80	Tank	110,000	37	6½	Steel	97,500	February	December	Amer. Car & Fdy.
	500	Cov. Hopper	140,000	29	3⅝	Steel	53,000	November	*	Amer. Car & Fdy.
(Electro-Metallurgical)	21	Gondola	100,000	41	5⅞	Composite	44,300	May	December	Amer. Car & Fdy.
Delaware, Lackawanna & Western	100	Cov. Hopper	140,000	26	3⅝	Steel	52,000	November	*	Amer. Car & Fdy.
	450	Gondola	100,000	41	6	Steel	45,000	July	*	Mount Vernon
Denver & Rio Grande Western	780	D.B. Gondola	140,000	46	0	Composite	59,800	August	....	Pressed Steel
	220	D.B. Gondola	140,000	46	0	Composite	59,800	August	*	Pressed Steel
	50	M.T. Gondola	140,000	65	6	Steel	61,357	August	*	Pressed Steel
Detroit, Toledo & Ironton	70	D.E. Gondola	140,000	52	6	Composite	62,800	February	*	Greenville
	50	Flat	140,000	53	6	Steel	61,000	February	Oct.-Nov.	Greenville
Diamond Alkali Co.	1	Tank	60,000	..	..	Steel	.....	January	December	General American
	2	Tank	60,000	..	..	Steel	.....	January	February	General American
Dow Chemical Co.	2	Tank	10,000g	..	..	Steel	.....	January	March	General American
	3	Tank	50,000	37	6½	Steel	98,000	February	December	Amer. Car & Fdy.
Duluth, Missabe & Iron Range	500	Ore	150,000	19	10⅞	Steel	45,500	March	Aug.-Sept.	Pullman-Standard
	500	Ore	140,000	19	10⅞	Steel	43,700	March	Sept.-Nov.	General American
	500	Ore	150,000	19	10⅞	Steel	44,649	March	*	Pressed Steel
	500	Ore	150,000	19	10⅞	Steel	43,500	April	November	Amer. Car & Fdy.
Du Pont de Nemours, E. I. & Co.	3	Tank	10,000g	..	..	Steel	.....	February	May	General American
	17	Tank	7,000g	..	..	Steel	.....	February	Aug.-Nov.	General American
	13	Tank	7,000g	..	..	Steel	.....	February	June	General American
	2	Tank	10,000g	..	..	Steel	.....	March	June	General American
	14	Tank	7,000g	..	..	Steel	.....	March	Aug.-Sept.	General American
	3	Tank	7,000g	..	..	Steel	.....	March	Jan.-Feb. '43	General American
	11	Tank	7,000g	..	..	Steel	.....	May	October	General American
	1	Tank	7,000g	..	..	Steel	.....	May	Feb. '43	General American
	7	Tank	7,000g	..	..	Steel	.....	June	October	General American
	1	Tank	7,000g	..	..	Steel	.....	June	December	General American
	2	Tank	7,000g	..	..	Steel	.....	July	November	General American
	17	Tank	7,000g	..	..	Steel	.....	July	Feb. '43	General American
	1	Tank	10,000g	..	..	Steel	.....	July	October	General American
	1	Tank	7,000g	..	..	Steel	.....	August	December	General American
	7	Tank	7,000g	..	..	Steel	.....	September	Jan.-Feb. '43	General American
	3	Tank	7,000g	..	..	Steel	.....	October	*	General American
	2	Tank	4,000g	25	2⅛	Steel	33,700	January	March	Amer. Car & Fdy.
	7	Tank	7,000g	29	3⅛	Steel	43,200	January	March	Amer. Car & Fdy.
	1	Tank	7,000g	29	3⅛	Steel	45,100	January	August	Amer. Car & Fdy.
Electro-Metallurgical Co.	25	Hopper	100,000	33	0	Steel	41,400	June	September	Pullman-Standard
	5	Flat	80,000	46	9¼	Steel	44,997	July	....	Pressed Steel
Elgin, Joliet & Eastern	10	Caboose	.....	23	2	Composite	36,300	March	Aug.-Oct.	Company Shops
Ethyl Gasoline Corp.	15	Tank	6,000g	..	..	Steel	.....	January	November	General American
Fraser-Brace Engineering Co.	2	Tank	7,850g	..	..	Steel	.....	April	Jan. '43	General American
	4	Tank	7,850g	33	1⅛	Steel	45,700	January	June	Amer. Car & Fdy.
	4	Tank	7,850g	33	1⅛	Steel	45,700	April	August	Amer. Car & Fdy.
Freyn Engineering Co. (Pittsburgh Steel)	30	Air Dump	30 cu. yds.	..	..	Steel	73,000	September	....	Pressed Steel
	15	Hopper	140,000	40	8	Steel	47,833	September	....	Pressed Steel
General Electric Co.	3	Cov. Hopper	140,000	29	3	Steel	52,400	January	September	Amer. Car & Fdy.
General Steel Castings Co. (for Defense Plant Corp.)	7	Air Dump	30 cu. yds.	..	..	Steel	68,500	May	December	Pressed Steel
	6	Flat	100,000	40	0	Steel	38,000	September	December	Amer. Car & Fdy.
Grand Trunk Western	200	Auto	80,000	50	6⅞	Steel	55,032	February	*	Pressed Steel
Granite City Steel Co. (for Defense Plant Corp.)	3	Flat	100,000	40	0	Steel	39,800	July	December	Amer. Car & Fdy.
	3	Flat	100,000	40	0	Steel	42,500	September	December	Amer. Car & Fdy.
	2	Slag Pot	180,000	24	10¼	Steel	31,800	October	December	Amer. Car & Fdy.
	10	Air Dump	100,000	..	..	Steel	.....	1942	Mar. '43	Austin-Western
Great Northern	1	Caboose	.....	30	0	Composite	50,000	February	June	Company Shops
	11	Caboose	.....	30	0	Composite	50,000	April	July-Aug.	Company Shops
	500	Ore	150,000	19	11	Steel	42,375	April	Sept.-Oct.	Bethlehem Steel
	500	Ore	140,000	19	10⅞	Steel	43,700	April	*	General American

† 1941 totals have been adjusted to include these cars which were not reported last year.

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Holston Ordnance Works	30	Tank	10,000g	..	..	Steel	.....	November	Jan.-Mar. '43	General American
	9	Tank	10,000g	..	..	Steel	.....	October	Jan.-Mar. '43	General American
	2	Tank	6,000g	..	..	Steel	.....	November	*	General American
	5	Tank	8,000g	33	2⅜	Aluminum	49,660	July	Jan. '43	Amer. Car & Fdy.
(Tennessee Eastman Corp.)	3	Tank	10,000g	33	11⅜	Aluminum	39,500	July	Jan. '43	Amer. Car & Fdy.
Inland Steel Co.	10	Air Dump	140,000	..	..	Steel	.....	1942	Jan. '43	Austin-Western
Kaiser Company	14	Air Dump	40 cu. yds.	..	..	Steel	87,500	July	....	Pressed Steel
Lehigh & Hudson River	8	Caboose	.....	..	..	Steel	40,900	January	October	Reading Co. Shops
Lehigh Valley	500	Hopper	100,000	30	9	Composite	.....	February	*	Bethlehem
	12	Caboose	.....	24	4⅜	Steel	44,000	May	August	Company Shops
Linde Air Products Co.	39	Box	140,000	40	7⅝	Steel	50,300	January	May	General American
	50	Box	140,000	40	7⅝	Steel	50,300	October	Feb. '43	General American
Louisiana & Arkansas	1	Caboose	80,000	28	7	Composite	.....	April	August	Company Shops
Louisville & Nashville	750†	Hopper	100,000	33	0	Steel	39,600	Dec. '41	*	Amer. Car & Fdy.
	100†	Cov. Hopper	140,000	29	3	Steel	53,100	Dec. '41	December	Amer. Car & Fdy.
	344†	Box	100,000	40	6	Steel	45,100	Dec. '41	June	Pullman-Standard
	56†	Box	100,000	40	6	Steel	45,100	Dec. '41	*	Pullman-Standard
	750†	Hopper	100,000	33	0	Steel	39,600	Dec. '41	*	Pullman-Standard
	100†	Box	100,000	50	6	Steel	52,600	Dec. '41	*	Pullman-Standard
	500†	Hopper	100,000	33	0	Steel	39,600	Dec. '41	*	Pressed Steel
	100†	Flat	100,000	63	6	Steel	49,000	Dec. '41	December	Amer. Car & Fdy.
Manufacturers Ry.	1	Hopper	.....	..	..	.....	.....	March	April	General American
McClean Contracting Co.	4	Flat	80,000	40	0	Steel	39,800	July	December	Amer. Car & Fdy.
Minneapolis, St. Paul & Sault Ste. Marie	2	Well	100,000	42	6	Steel	50,800	April	May	Company shops
Missouri-Kansas-Texas	20	Caboose	.....	30	7⅝	Composite	42,500	March	August	Company Shops
	17	Caboose	.....	30	7⅝	Composite	42,500	November	Jan. '43	Company Shops
	10	Cab.-Cch.-Bag.	.....	38	8¾	Steel	53,200	March	September	Company Shops
Missouri Pacific	50	Cov. Hopper	140,000	29	3	Steel	53,000	August	Jan. '43	Amer. Car & Fdy.
Monongahela Connecting	20	Hopper	200,000	43	0	Steel	83,000	December	May '43	Company Shops
	65	Gondola	240,000	38	0	Steel	51,300	December	April '43	Company Shops
Monsanto Chemical Co.	2	Tank	4,000g	..	..	Steel	.....	November	*	General American
	1	Tank	8,000g	34	4	Aluminum	36,000	January	May	Amer. Car & Fdy.
	2	Tank	7,000g	29	3⅛	Steel	42,400	February	May	Amer. Car & Fdy.
Nashville, Chattanooga & St. Louis	50	Cov. Hopper	140,000	29	3	Steel	53,000	February	December	Amer. Car & Fdy.
National Aniline Def.	4	Tank	7,850g	..	..	Steel	.....	May	December	General American
New York Central	3	Transformer	250,000	..	..	Steel	126,000	January	June	Despatch Shops
	300	Flat	140,000	53	6	Steel	59,100	May	Jan. '43	Despatch Shops
	1,100	H.S. Gondola	110,000	40	7	Composite	41,900	May	September	Despatch Shops
New York, Chicago & St. Louis	25	Caboose	60,000	24	0½	Composite	41,900	February	*	Magor
	50	Cov. Hopper	140,000	29	3	Steel	53,000	February	December	Amer. Car & Fdy.
	50	Flat	100,000	53	6	Steel	49,300	February	November	Pullman-Standard
Nicaro Nickel Co.	65	Air Dump	34 cu. yds.	..	..	Steel	56,500	July	....	Pressed Steel
Norfolk & Western	100	Gondola	140,000	52	6	Composite	55,560	September	*	Pressed Steel
	25	Flat	140,000	53	6	Steel	61,000	September	*	Greenville
Northern Pacific	500†	Hopper	140,000	40	8	Steel	54,700	Dec. '41	December	Amer. Car & Fdy.
Ohio River Power	2	Air Dump	30 cu. yds.	..	..	Steel	65,000	February	November	Pressed Steel
Pacific Fruit Express Co.	750	Refrigerator	80,000	40	10¾	Steel	53,500	May	*	Amer. Car & Fdy.
Pennsylvania	20	Flat	140,000	39	0	Steel	51,200	February	September	Company Shops
	1	Box	100,000	50	6	Composite	52,800	February	April	Company Shops
	1	Hopper	100,000	33	0	Composite	39,500	February	April	Company Shops
Pere Marquette	250	Flat	140,000	53	6	Steel	61,000	February	Dec.-Jan. '43	Greenville
Phelps Dodge Corp.	140	Air Dump	190,000	..	..	Steel	.....	1942	December	Austin-Western
	6	Flat	80,000	46	9¼	Steel	44,997	June	....	Pressed Steel
Phillips Petroleum Co.	2	Tank	40,000	..	..	Steel	.....	January	April	General American
	10†	Tank	40,000	..	..	Steel	.....	Dec. '41	Sept.-Oct.	General American
	9	Tank	10,000g	..	..	Steel	.....	January	February	General American
Pittsburgh Plate Glass	5	Tank	60,000	..	..	Steel	.....	February	December	General American
Pittsburg & Shawmut	100	Hopper	100,000	33	0	Steel	41,833	March	*	Pressed Steel
Pittsburgh Steel Co.	10	Air Dump	30 cu. yds.	..	..	Steel	73,000	September	*	Pressed Steel
	4	Hot Slag	140,000	32	6	Steel	.....	September	*	Pressed Steel
Raymond Concrete Pile Co. (for Heppenstall-Eddystone Corp.)	4	Gondola	100,000	35	6	Steel	39,000	July	November	Amer. Car & Fdy.
Reading	1,000	Hopper	110,000	31	0	Steel	42,700	January	*	Company Shops
Republic Steel Corp.	20	Gondola	140,000	39	11	Steel	55,000	October	*	Pressed Steel
	50	Gondola	140,000	39	11	Steel	54,325	October	*	Pressed Steel
	8	Air Dump	50 cu. yds.	..	..	Steel	87,300	July	....	Pressed Steel
	57	L.S. Gondola	100,000	37	9	Steel	50,130	July	....	Pressed Steel
	71	Ore	150,000	19	10⅞	Steel	42,250	March	December	Amer. Car & Fdy.
	10	Hopper	100,000	33	0	Steel	40,800	April	August	Amer. Car & Fdy.
	125	Hopper	140,000	41	3	Steel	55,000	October	*	Amer. Car & Fdy.
	50	Hopper	140,000	41	3	Steel	51,000	October	*	Amer. Car & Fdy.
	25	Gondola	140,000	40	6	Steel	49,000	November	*	Amer. Car & Fdy.
	25	Gondola	100,000	56	0	Steel	57,500	November	*	Amer. Car & Fdy.
	8	Air Dump	140,000	..	..	Steel	.....	1942	Feb. '43	Austin-Western
(for Defense Plant Corp.)	8	Box	100,000	40	6	Steel	43,400	April	July	Amer. Car & Fdy.
Richmond, Fredericksburg & Potomac	20	S.S. Box	100,000	50	6	Steel	52,600	January	*	Pullman-Standard
Rubber Reserve Co.	250	Tank	11,500g	38	10½	Steel	58,000	January	September	Amer. Car & Fdy.
St. Louis-San Francisco	1	Flat	110,000	42	0	Steel	138,000	January	May	Company Shops
	20	Caboose	80,000	29	0	Composite	44,800	Jan. & Mar.	Jan.-May	Company Shops
Sanderson & Porter	100	Box	100,000	40	6	Steel	45,400	April	Nov.-Dec.	General American
Scullin Steel Co.	8	Flat	100,000	46	9¼	Steel	46,700	October	*	Pressed Steel
Shell Chemical Co.	2	Tank	12,000g	..	..	Steel	.....	January	June	General American
Shippers Car Line	2	Flat	140,000	46	10	Steel	47,400	March	July	Amer. Car & Fdy.
	8	Tank	8,000g	34	4	Aluminum	48,000	April	April	Amer. Car & Fdy.
	7	Tank	4,500g	28	0	Steel	42,200	April	April	Amer. Car & Fdy.
	20	Tank	8,000g	31	6	Steel	41,320	April	April	Amer. Car & Fdy.
	6	Tank	8,000g	33	3⅛	Steel	48,600	April	April	Amer. Car & Fdy.
	4	Tank	4,000g	25	2⅛	Steel	38,300	April	April	Amer. Car & Fdy.
	1	Tank	4,000g	25	2⅛	Steel	36,220	April	April	Amer. Car & Fdy.
	22	Hopper	140,000	29	3	Steel	52,400	August	October	Amer. Car & Fdy.
	753	Tank	10,000g	34	11¾	Steel	43,300	August	Mar. '43	Amer. Car & Fdy.
	3	Tank	6,000g	29	1½	Steel	38,500	September	November	Amer. Car & Fdy.
	15	Tank	10,500g	37	0	Steel	67,000	April	October	Amer. Car & Fdy.
	5	Tank	10,000g	34	8¾	Steel	61,500	April	September	Amer. Car & Fdy.
	2	Tank	8,000g	34	4	Aluminum	45,600	April	May	Amer. Car & Fdy.
	3	Tank	8,000g	34	4	Steel	36,340	April	July	Amer. Car & Fdy.
	7	Tank	7,000g	29	3⅛	Steel	43,160	April	July	Amer. Car & Fdy.
Southern	2,506	Hopper	100,000	33	0	Steel	41,400	February	*	Pullman-Standard
(C. N. O. & T. P.)	1,000	Gondola	100,000	41	6	Composite	.....	February	*	Mount Vernon
Sun Oil Co.	1†	Tank	140,000	38	0	Steel	.....	Dec. '41	March	General American
Tennessee Coal, Iron & R. R. Co.	56	Hopper	140,000	38	9⅞	Steel	61,700	January	*	Company Shops
Tennessee Valley Authority	3	Tank	7,200g	..	..	Steel	.....	January	May-June	General American
Timken Roller Bearing Co.	4	Air Dump	30 cu. yds.	..	..	Steel	.....	November	....	Pressed Steel
	16	Gondola	140,000	..	..	Steel	47,650	November	*	Pressed Steel
	20	Gondola	140,000	40	0	Steel	57,000	January	October	Amer. Car & Fdy.

† 1941 totals have been adjusted to include these cars which were not reported last year.

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date o Order	Date o Delivery	Builder
Union Pacific	1,000	Gondola	100,000	41	0	Composite	51,000	August	Jan.-Mar. '43	Pullman-Standard
	1,000	Ballast	100,000	33	4⅝	Steel	44,800	March	*	Amer. Car & Fdy.
Union Tank Car Co.	100	Tank	100,000	..	..	.....	.....	April	1943	Company Shops
Utah Copper Co.	100	Gondola	200,000	24	0⅝	Steel	47,983	August	Jan. '43	Pressed Steel
	25	Air Dump	40 cu. yds.	..	..	Steel	80,300	February	Feb. '43	Pressed Steel
Wabash	20	Caboose	.....	28	0	Steel	.....	September	*	Company Shops

Note: Information as to whether or not cars were authorized for building by the War Production Board is shown in "Date of Delivery" column. Cars delivered prior to April, 1942, required no WPB authorization. Cars delivered subsequent to April, 1942, or shown as scheduled for delivery in 1943, have been authorized. Cars ordered but without WPB authority to build are marked with an asterisk (*). Where no date or asterisk is shown, cars are authorized, but definite delivery date has not been set.

United States—Export

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
P. P. Bolivianes	150	Tank	.....	..	..	Steel	.....	August	*	Amer. Car & Fdy.
Cia. De Chemin De Fer Du Bas Congoau Katanga	100	Box	77,000	36	0	Steel	38,500	August	*	Pressed Steel
Companhia Siderurgica Nacional	2	Tank	10,000g	..	..	Steel	.....	January	*	General American
	1	Tank	6,000g	..	..	Steel	.....	January	*	General American
Daniel Vela	3	Tank	40,000	..	..	Steel	.....	February	*	General American
Defense Plant Corp. (Freeport Sulphur Co.)	2	Flat	100,000	40	0	Steel	39,000	April	October	Amer. Car & Fdy.
Great Western of Brazil	21	Gondola	60,000	34	5⅜	Steel	24,900	February	Jan. '43	Amer. Car & Fdy.
International Diesel Elec. Co.	5	Flat	100,000	40	0	Steel	40,000	February	October	Amer. Car & Fdy.
Mexican Government	500	Box	80,000	40	6	Composite	38,000	January	*	Magor
	70	Air Dump	30 cu. yds.	29	6	Steel	61,850	February	*	Magor
	200	Gondola	100,000	38	4	Steel	43,900	February	Feb. '43	Magor
	20	Box	100,000	40	6	Composite	61,180	February	*	Magor
National Railways of Mexico	150	Tank	10,000g	34	11¾	Steel	43,300	April	*	Amer. Car & Fdy.
	50	Tank	10,000g	34	11¾	Steel	43,300	April	Apr. '43	Amer. Car & Fdy.
	500	Box	100,000	40	6	Steel	43,000	April	*	Amer. Car & Fdy.
National Steel Co. of Brazil	10	Air Dump	100,000	..	..	Steel	.....	1942	Feb. '43	Austin-Western
Petroleos Mexicanos	2	Tank	40,000	..	..	Steel	.....	September	*	General American
	2	Tank	40,000	..	..	Steel	.....	February	*	General American
Standard Oil Co. of N. J.	4	Tank	5,000g	..	..	Steel	.....	April	September	General American
Standard Vacuum Oil Co.	12	Tank	10,560g	..	..	Steel	.....	June	November	General American
Texas Company	4	Tank	6,000g	..	..	Steel	.....	March	Jan.-Feb. '43	General American
United Fruit Co.	40	Flat	25,000	30	0	Steel	14,070	June	Feb. '43	Magor
Viuda Francisco Max Junqueira	30	Sugar Cane	40,000	27	9	Composite	27,263	October	....	Pressed Steel

* Indicates building of cars has not been authorized by the War Production Board.

Canada

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Aluminum Co. of Canada	25	Tank	10,000g	33	7½	Steel	58,940	April	August	Can. Car & Fdy.
Canadian General Transit Co.	100	Tank	10,000g	33	7½	Steel	48,700	April	November	Can. Car & Fdy.
Canadian National	50	Box-Baggage	80,000	40	6	Steel	.....	November	....	Can. Car & Fdy.
Canadian Pacific	150	Ore	160,000	25	11	Steel	50,200	March	November	National Steel
	200	S.S. Box	100,000	40	6	Composite	.....	April	May '43	National Steel
	30	Caboose	.....	28	2	Composite	38,000	January	August	Company Shops
	500	D.S. Box	80,000	40	6	Composite	.....	October	May '43	Can. Car & Fdy.
	50	S.S. Box	100,000	40	6	Composite	.....	October	Apr. '43	Eastern Car Co.
Department Munitions & Supply	200	Tank	10,000g	40	6	Steel	.....	November	....	Can. Car & Fdy.

Canada—Export

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Aluminum Company	252	Quarry-Dump	.....	18	8	Steel	.....	September	....	Can. Car & Fdy.
Chemin de Fer de Congo	40	Box	59,400	40	6	Steel	.....	May	....	Can. Car & Fdy.
T. Geddes Grant, Ltd.	20	Cane	20,000	18	6	Steel	16,340	March	....	Can. Car & Fdy.
Newfoundland Railway	20	Tank	5,000g	29	5	Steel	.....	July	....	Can. Car & Fdy.

Line Abandonments

(*Continued from page 110*)

individual years having ranged from 282 in 1927 to 2,516 in 1942. During the entire 26-year period, beginning with 1917 a total of 29,237 miles of lines have been abandoned, an average of more than 1,100 miles annually, while only 10,684 miles of new lines have been constructed, leaving a net decrease of 18,553 miles of road.

Of equal interest with the mileage abandoned by individual roads and the total for all roads, is the distribution of these abandonments by states, for the states themselves are vitally concerned. Texas had the largest aggregate abandonment of any state during 1942, amounting to 339 miles for all lines within the state. California ranked second with 225 miles, while Utah came next with 166 miles and Pennsylvania was in fourth place with 153 miles. At the other extreme, seven states had no abandonments during the year, all of this information together with the number of miles abandoned in each of the remaining states being shown in the accompanying table. During the 11 years ending with 1942, Texas again stood first with 1,265 miles abandoned. Missouri ranked second with 988 miles abandoned during the same period, with California closely behind in third place with 959 miles and Michigan fourth with 875 miles.

During this same 11-year period a total of 18,832 miles were abandoned in the 48 states and Alaska. By regions the abandonments have been: New England states, 875 miles; North Atlantic states, 1,639 miles; Southeastern states, 3,696 miles; Middle Western states, 4,878 miles; Northwestern states, 1,279 miles; Southwestern states, 4,441 miles; and the Pacific Coast states, 1,808 miles.

Prior to 1932, abandonments in Canada and Mexico had been negligible. However, in 1932 and 1933, the Canadian roads abandoned a total of 282 miles, since which time abandonments have ranged from 55 to 399 miles annually, until 1942, in which year they aggregated only 23 miles. During the 11-year period beginning with 1932, a total of 1,165 miles of lines have been abandoned in Canada. The only abandonment in Mexico during 1942 was the 21-km. line of the Mexico Northwestern between San Antonio, Chi., and Cusihuiriachic.

Many Locomotives Ordered Were Unauthorized by WPB

Long list of "frozen" railroad applications reveals pent-up demand for additional motive power

By Arthur J. McGinnis

Associate Editor

EARLY in January, 1942, the former Supply, Priorities and Allocations Board (which was supplanted in that month by the War Production Board) authorized the granting of priorities for the continued production through April of locomotives "now on order or now scheduled for production for stock, consisting of 248 steam locomotives, 58 electric locomotives and 620 Diesel locomotives."

This ruling was followed on April 4 by the War Production Board's limitation orders by which it assumed control of the production and distribution of new railroad equipment and subsequent to that date the board's authorization was required for the construction and delivery of new motive power. On April 8, the board announced that materials would be allocated during the remainder of 1942 for the production of 300 locomotives in addition to the 926 contemplated in schedules running to May 1.

With the number of locomotives that could be built thus limited by government control and with locomotive building capacity largely devoted to turning out engines ordered by the United States War and Navy departments, the volume of orders placed in 1942 does not reflect the carriers' demands for additional motive power or their estimates of current and anticipated motive power requirements.

Orders placed in 1942 for domestic service totaled 1,255 locomotives, of which 368 were steam, 875 Diesel and 12 electric. Of these, 928 were ordered by railroads, including 360 steam, 563 Diesel and 5 electric units, and 327 by industrial companies and private car lines, including 8 steam, 312 Diesel and 7 electric units. Railroad steam locomotive orders were divided 305 to contract builders and 55 to company shops.

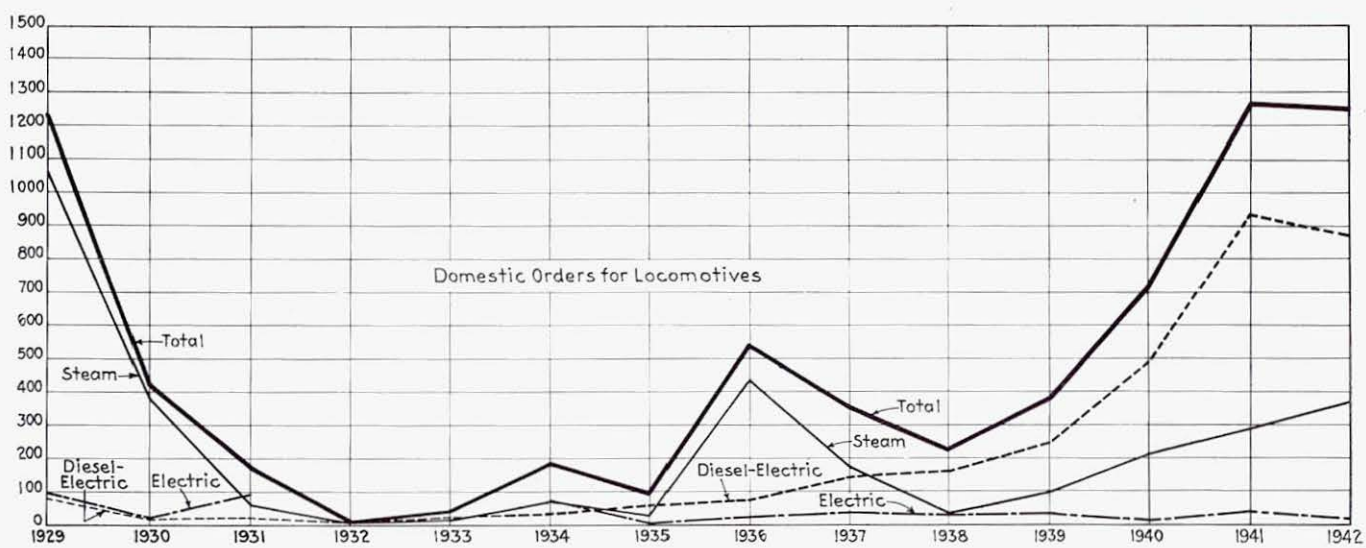
Because of the war, the *Railway Age* is not permitted to publish the number of locomotives ordered or built for U. S. Government departments either for domestic service or for export, and, for comparative purposes, government orders have also been excluded from 1941 totals in tables I and II.

The railroads sought steam power during the year

Table I—Locomotive Orders, 1929-1942

Year	Domestic				U. S. Export	Canadian (Inc. Export)
	Steam	Diesel	Electric	Total		
1942	368	875	12	1,255	32	53
1941	293	937	38	1,268	85	79
1940	207	492	13	712	85	3
1939	119	249	32	400	40	56
1938	36	160	29	225	24	35
1937	173	145	36	354	56	57
1936	435	77	24	536	22	1
1935	30	60	7	97	15	27
1934	72	37	76	185	17	..
1933	17	25	..	42	7	..
1932	5	7	..	12	1	1
1931	62	21	91	174	28	2
1930	382	18	21	421	20	95
1929	1,055	80	95	1,230	106	77

Note.—The totals of domestic and U. S. export orders for years 1942 and 1941 exclude U. S. Government purchases. Domestic orders placed in 1941 are adjusted to eliminate orders subsequently cancelled in 1942 due to WPB restrictions on building. In certain instances, domestic orders placed in December are not reported until following year; statistics for years 1929-1941 are adjusted to eliminate this overlap.



chiefly for freight service, 332 of the engines ordered being so classified with 8 intended for freight and passenger service and 20 for switching service. Of the 360 ordered, 216 or 60 per cent were authorized for building by the War Production Board and 144 or 40 per cent were without WPB authority to build at the year-end. The eight steam units ordered by the Columbia Steel Company are also "frozen."

Largest steam locomotive order placed during the year and authorized by the WPB was let in March by the Southern Pacific and comprised 30 of the road's 4-8-8-2 type cab-ahead engines, among the heaviest and most powerful in the world, for freight service on the

Table II—Domestic Diesel Locomotive Orders by Horsepower and Purchaser

	Railroads		Industrial Cos. and Private Car Lines		Total	
Horsepower:	1942	1941	1942	1941	1942	1941
6,000	3	..	..	..	3	..
5,400	100	40	..	..	100	40
4,000	3	23	..	..	3	23
2,700	..	5	..	..	..	5
2,000	23	31	..	..	23	31
1,500	..	1	..	6	..	7
1,000	310	289	10	21	320	310
600 or 660	98	206	7	22	105	228
Less than 600	26	85	295	208	321	293
Total	563	680	312	257	875	937

Note:—1941 totals are adjusted to eliminate orders subsequently cancelled in 1942 due to WPB restrictions on building.

company's mountain divisions, and ten 4-8-4 streamlined units of the daylight type. Deliveries of the cab-ahead units are expected to be completed by March, 1943, and of the daylight units by May, 1943. Orders for these 40 locomotives followed a previous purchase by the Southern Pacific in March, 1941, of 50 engines, including 40 4-8-8-2's and ten 4-8-4's and represents a most outstanding accumulation of steam locomotive power by a single railroad.

The Pennsylvania placed orders for 60 2-10-4 type units, 35 with the railroad's own shops, which were released for building by the WPB, and 25 with a contract builder, which were not authorized at the year-end. Other leading steam locomotive orders placed in 1942, with the number authorized for building by the War Production Board shown in parentheses, included the following: 20 4-8-4 type (none authorized) by the Atchison, Topeka & Santa Fe; 15 0-8-0 switchers (5 authorized) by the Chesapeake & Ohio; 15 4-8-4 type (authorized) by the Delaware & Hudson; 15 4-8-4 type (none authorized) by the Missouri Pacific; 25 4-8-2 type (authorized) by the New York Central; 15 2-6-6-4 type (10 authorized) by the Norfolk & Western; 12 4-6-6-4 type (authorized) and 10 4-8-4 type (not authorized) by the Northern Pacific; and 25 4-6-6-4 type (authorized) by the Union Pacific.

Most Ordering Preceded WPB Decree

The effect of limited government-authorized building programs on new purchasing is evident in a monthly analysis of new orders placed. Of the 360 steam locomotives ordered by railroads, 227 or 63 per cent were ordered during the first three months of the year before the April 4 "freezing" order and 26 in May. The 107 ordered during the final eight months were placed three in May, nine in June, six in July, none in August, sixteen in September, none in October, 73 in November and none in December. The 73 ordered in November, in which month the WPB announced a new building program of 250 steam locomotives for the first eight months of 1943, were not authorized for building at the year-end.

Diesel locomotive orders reported in 1942 totaled 875 engines, of which 563 were placed by railroads and 312 by industrial companies and private car lines. Of the 563 ordered by railroads, 434 were classified for switching service, 8 for passenger service, 21 for freight and passenger service and 100 for freight service. The 100 freight locomotives of 5,400 hp. represent an increase of 60 over the number of the same horsepower ordered in 1941 and is notable as indicating the type of power now needed. For switching service, the carriers indicated a preference during the year for heavier locomotives of 1,000 hp.

Slow to Okay Diesel Orders

The majority of Diesel engines ordered by the carriers during the year, 415 or 74 per cent of the total, were without WPB authority to deliver at the year-end, 137 or 24 per cent were authorized for delivery and 11 were delivered prior to the April 4 limitation order and required no authorization. Of the 312 Diesels ordered by industrial companies and private car lines, ten of 1,000 hp., seven of 600 hp. and 295 of less than 600 hp., 210 were reported released for delivery, one was not released, 17 were delivered prior to April 4 and there were 84 for which this information was not available at publication time.

An analysis of orders placed for Diesel-electric and other internal combustion type locomotives by horsepower and purchaser is presented in Table II.

As with other types of new railroad equipment, as the number of unauthorized locomotives increased during the latter months of the year, new orders tended to de-

Table III—Locomotives Built, 1929-1942

Year	Domestic	U. S. Export	Total U. S.	Canadian
1942	906 (a)	11 (b)	917	71 (c)
1941	1,047	57	1,104	3
1940	435	66	501	59
1939	338	16	354	1
1938	272	28	300	46
1937	526	44	570	45
1936	157	22	179	23
1935	184	17	201	4
1934	91	19	110	..
1933	57	6	63	..
1932	102	18	120	3
1931	181	17	198	24
1930	972	51	1,023	111
1929	926	139	1,065	96

(a) Excludes locomotives built for U. S. Government departments.
(b) Excludes U. S. Government and lend-lease orders.
(c) Includes three steam locomotives for export.

crease. Railroad Diesel orders were let as follows: 46 in January, 111 in February, 84 in March, 89 in April, 50 in May, 25 in June, 50 in July, 55 in August, six in September, 21 in October, 25 in November and one in December. Orders by industrial companies were placed 28 in January, 24 in February, 42 in March, 41 in April, 69 in May, 31 in June, 28 in July, 13 in August, 14 in September, 11 in October, four in November, four in December and there were three for which the month of order was not available.

Leading purchases of Diesel-electric locomotives by the carriers, with the number authorized by the WPB shown in parentheses, included 38 of 5,400 hp., 44 of 1,000 hp., two of 660 hp., and three of 380 hp. (six of 1,000 hp. authorized) by the Atchison, Topeka & Santa Fe; three of 6,000 hp., six of 5,400 hp., and ten of 1,000 hp. (ten of 1,000 hp. authorized) by the Atlantic Coast Line; 15 of 5,400 hp. and 15 of 1,000 hp. (none au-

thorized) by the Chicago, Burlington & Quincy; 14 of 1,000 hp., eight of 600 hp. and one of 360 hp. (ten of 1,000 hp. not authorized) by the Chicago, Rock Island & Pacific; 25 of 1,000 hp. (five authorized) by the Lehigh Valley; two of 5,400 hp., 30 of 660 or 600 hp. (15 of 660 or 600 hp. authorized) by the New York Central; 20 of 2,000 hp. and 20 of 660 hp. (ten of 2,000 hp. authorized) by the New York, New Haven & Hartford; 28 of 1,000 hp., two of 660 hp., one of 350 hp. and one of 380 hp. (26 of 1,000 hp. not authorized) by the St. Louis-San Francisco; and 30 of 1,000 hp. (not authorized) by the Southern Pacific.

Leading purchases by industrial companies and private car lines included 13 locomotives by E. B. Badger & Son; 15 by the Bethlehem Steel Corporation; 11 by the E. I. DuPont deNemours Co.; and ten by the Midland Ordnance Foundation.

The War Production Board's new equipment building program announced on November 19 authorizes the delivery of 100 Diesel-electric switching locomotives during the first six months of 1943 and 36 Diesel road locomotives during the first eight months.

The 12 electric locomotives ordered in 1942 were placed five by the New York, New Haven & Hartford and seven by the Phelps Dodge Corporation. Orders placed in the United States for export, exclusive of U. S. Government and lend-lease orders, comprised 29 Diesel switchers and three electric road locomotives. Orders placed in Canada comprised 53 steam locomotives, chiefly 25 4-8-4 type freight units by the Canadian National and 20 2-8-2 and five 4-6-2 freight units by the Canadian Pacific. Table I shows domestic, export and Canadian orders placed in years 1929-1942, inclusive.

Government Orders Are Kept Secret

Locomotive deliveries during the year, exclusive of engines built for the government and lend-lease, totaled 906 units for domestic service, of which 290 were steam, 581 (partially estimated) Diesel, and 35 electric, and 11 (partially estimated) for export. Domestic steam deliveries were divided 34 by railroad shops and 256 by contract builders.

The appended tables contain a detailed statement of domestic orders for new locomotives placed during 1942 by railroads, industrial companies and private car lines; also, those placed for export and in Canada. As indicated by footnotes on the tables, information as to whether or not locomotives were authorized for building or delivery by the War Production Board is shown in "Date of Delivery" column. Locomotives delivered prior to April, 1942, required no WPB authorization. Locomotives delivered subsequent to April, 1942, or shown as scheduled for delivery in 1943, have been authorized. Locomotives ordered, but without WPB authority to build or deliver, are marked with an asterisk (*). For 84 Diesel locomotives ordered by industrial companies, this information was not available at publication time and these locomotives are marked with a dagger (†). Where no date or symbol is shown, locomotives are authorized, but definite delivery date was not reported.

Limitations of These Statistics

The list of orders was compiled from information furnished to the *Railway Age* by the railroads, private car lines, and other purchasers of locomotives in response to requests for this information. Data thus compiled were then checked against lists of orders supplied by locomotive builders. In some instances, particularly in respect of orders placed by industrial companies with the General Electric Company and other builders with larger orders from this source, because of the early publication date of this compilation, certain orders placed in December may be omitted. While the information is believed to be reliable, the *Railway Age* does not guarantee the statistical accuracy or completeness of the list or totals drawn therefrom. However, it is believed that such omissions as occur will be found to be relatively small and unimportant, and will not vitiate the value of the figures, particularly with respect to comparisons with preceding years.

Compilation of the list of orders was particularly complicated by the unusual conditions resulting from government control over the production and distribution of motive power. Subsequent to April 4, the War Production Board's authorization of an order for steam power was necessary before building could begin. Diesel locomotives are built for stock and blanket authorizations covering a number of locomotives granted to builders with WPB releases necessary for deliveries. Instances were reported of steam locomotives ordered by a railroad from one builder being authorized for delivery from a second builder. Similarly, Diesel locomotives ordered from one builder were reported released and delivered from the stock of a second builder. In the absence of information of the cancellation of the original order, the *Railway Age* necessarily listed these locomotives as orders with both builders, showing the original order, which may be subsequently cancelled, as unauthorized. Because certain of the locomotives ordered in 1942 and still on order from 1941 placements may not be released for building and may be subsequently cancelled during 1943, a comparison of the volume of locomotives ordered in 1942 with the number ordered in preceding years is not of the usual value, although this comparison was set forth in tables I and II for such significance as may be noted therein.

Steam Locomotive Orders in 1942

For Service in the United States

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of Order	Date of Delivery	Builder
Atchison, Topeka & Santa Fe..	20	4-8-4	Freight	511,000	66,000	28 x 32	November	*	Baldwin
Bessemer & Lake Erie.....	2	0-8-0	Sw.	282,000	64,309	25 x 30	April	1943	American
	5	2-10-4	Freight	519,740	96,700	31 x 32	April	*	Baldwin
Central of Georgia.....	8	4-8-4	Pass. & Frt.	437,000	63,200	27 x 30	November	*	Baldwin
Chesapeake & Ohio.....	5	0-8-0	Sw.	244,000	57,200	25 x 28	January	November	Lima
	10	0-8-0	Sw.	244,000	57,200	25 x 28	January	*	Lima
Columbia Steel Co. (D. P. C.)..	8	0-8-0	Sw.	250,000	61,500	26 x 28	April	*	Baldwin
Delaware & Hudson.....	15	4-8-4	Freight	448,000	.....	24½ x 32	February	1943	American
Denver & Rio Grande Western.	6	4-6-6-4	Freight	641,700	105,000	23 x 32 (4 cyl.)	June	*	Baldwin
	6	4-6-6-4	Freight	625,000	.....	21 x 32	September	1943	American
Detroit, Toledo & Ironton.....	4	2-8-2	Freight	369,500	55,600	23 x 30	April	*	Lima
Duluth, Missabe & Iron Range.	10	2-8-8-4	Freight	695,000	140,000	26 x 32 (4 cyl.)	March	Dec.-Feb. '43	Baldwin
Indianapolis Union.....	3	0-8-0	Sw.	250,000	61,500	26 x 28	June	*	Baldwin
Lehigh & Hudson River.....	3	4-8-2	Freight	416,000	67,000	28 x 31	May	*	Baldwin
Lehigh Valley.....	10	4-8-4	Freight	441,440	66,500	27 x 30	November	*	Builder to be determined

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of Order	Date of Delivery	Builder
Missouri Pacific	15	4-8-4	Freight	491,000	67,200	26 x 30	November	*	Baldwin
Nashville, Chattanooga & St. Louis	10	4-8-4	Freight	400,500	57,000	25 x 30	November	*	American
New York Central	25	4-8-2	Freight	396,000	59,000	26 x 30	February	Nov.-Jan. '43	Lima
	5**	.....	Tender	.....	.....	.....	July	Apr. '43	Company Shops
New York, Chicago & St. Louis	10	2-8-4	Freight	421,000	77,200	25 x 34	February	1943	Lima
Norfolk & Western	10	2-6-6-4	Freight	573,000	114,000	24 x 30 (4 cyl.)	April	Jan.-Mar. '43	Company Shops
	5	2-6-6-4	Freight	573,000	114,000	24 x 30 (4 cyl.)	April	*	Company Shops
Northern Pacific	12	4-6-6-4	Freight	643,000	.....	23 x 32 (4 cyl.)	February	Jan. '43	American
	10	4-8-4	Freight	502,500	69,800	28 x 31	February	*	Baldwin
Pennsylvania	25	2-10-4	Freight	.....	108,250	29 x 34	March	Feb. '43	Company Shops
	25	2-10-4	Freight	566,000	93,250	29 x 34	March	*	Lima
	10	2-10-4	Freight	.....	108,250	29 x 34	September	Mar. '43	Company Shops
	30**	.....	Tenders	.....	.....	.....	March	July-Aug. '43	Company Shops
Richmond, Fredericksburg & Potomac	10	2-8-4	Freight	432,800	64,100	25 x 34	March	Jan.-Feb. '43	Lima
St. Louis-San Francisco	10	4-8-4	Freight	437,000	63,200	27 x 30	November	*	Baldwin
St. Louis Southwestern	5	4-8-4	Freight	425,000	61,564	26 x 30	1942	Dec.-Feb. '43	Company Shops
Southern Pacific	30	4-8-8-2	Pass. & Frt.	657,900	124,300	24 x 32 (4 cyl.)	March	Nov.-Mar. '43	Baldwin
	10	4-8-4	Freight	448,250	64,200	27 x 30	March	Apr.-May '43	Lima
Union Pacific	25	4-6-6-4	Freight	625,000	97,350	21 x 32 (4 cyl.)	February	1943	American
Western Pacific	6	4-8-4	Freight	448,250	77,200	27 x 30	July	Apr. '43	Lima

**Not included in totals.

Note:—Information as to whether or not locomotives were authorized for building by the War Production Board is shown in "Date of Delivery" column. Locomotives delivered prior to April, 1942, required no WPB authorization. Locomotives delivered subsequent to April, 1942, or shown as scheduled for delivery in 1943, have been authorized. Locomotives ordered but without WPB authority to build are marked with an asterisk (*). Where no date or asterisk is shown, locomotives are authorized, but definite delivery date has not been set.

Canada

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of Order	Date of Delivery	Builder
Algoma Steel Corp.	1	0-4-0	Sw.	100,000	21,200	16½ x 22	September	Mar. '43	Canadian
Canadian Car & Foundry Co.	1	0-6-0	Sw.	125,800	28,720	19 x 26	February	September	Canadian
	1	0-6-0	Sw.	125,800	28,720	19 x 26	September	Mar. '43	Canadian
Canadian National	25	4-8-4	Freight	396,000	.....	25½ x 30	April	1943	Montreal
Canadian Pacific	2	4-6-2	Freight	238,000	34,000	20 x 28	February	1943	Company Shops
	3	4-6-2	Freight	323,500	45,000	22 x 30	February	1943	Canadian
	20	2-8-2	Freight	334,000	57,500	22 x 32	February	1943	Canadian

Electric Locomotives

For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Weight	Horsepower	Date of Order	Date of Delivery	Builder Electrical Equipment—Locomotive
New York, New Haven & Hartford	5	2-C+C-2	Freight	500,000	4,900	January	Jan.-Mar. '43	General Electric
Phelps Dodge Corporation	7	B-B	Sw.	250,000	840	May	Jan.-Mar. '43	West.-Baldwin

Export

Purchaser	No.	Wheel arrangement	Service	Weight	Horsepower	Date of Order	Date of Delivery	Builder Electrical Equipment—Locomotive
Chile Exploration Co.	3	B-B	Road	160,000	660	September	.....	General Electric

Diesel-Electric, Gas-Electric and Other Internal-Combustion Locomotives

Railroad Orders—For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of Order	Date of Delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Alton	2	2(A1A-A1A)	Pass.	Diesel-Elec.	626,600	4,000	March	*	Electro-Motive
Ann Arbor	2	B-B	Sw.	Diesel-Elec.	198,000	660	October	*	G. E.-American
Atchison, Topeka & Santa Fe	2	B-B	Sw.	Diesel-Elec.	198,000	660	August	*	G. E.-American
	5	B-B	Sw.	Diesel-Elec.	230,000	1,000	January	July-Aug.	G. E.-American
	16	B-B	Sw.	Diesel-Elec.	230,000	1,000	August	*	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	February	October	West.-Baldwin
	4	B-B	Sw.	Diesel-Elec.	240,000	1,000	February	*	West.-Baldwin
	18	B-B	Sw.	Diesel-Elec.	240,000	1,000	July	*	West.-Baldwin
	5 ♦	B-B	Sw.	Diesel-Elec.	250,000	1,000	Dec. '41	*	Electro-Motive
	3	B-B	Sw.	Diesel-Elec.	88,000	380	August	*	G. E.-Cater.
	10	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	February	*	Electro-Motive
	15	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	August	*	Electro-Motive
	13	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	April	*	Electro-Motive
Atlanta & St. Andrews Bay	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	November	November	G. E.-American
Atlantic & East Carolina	1	B-B	Road	Diesel-Elec.	88,000	410	October	.....	G. E.-Buda
Atlantic Coast Line	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	March	July-Aug.	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	March	.....	West.-Baldwin
	3	B-B	Sw.	Diesel-Elec.	230,000	1,000	April	June	G. E.-American
	3	B-B	Sw.	Diesel-Elec.	250,000	1,000	February	August	Electro-Motive
	3	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	March	*	Electro-Motive
	3	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	June	*	Electro-Motive
	3	3(A1A-A1A)	Pass.	Diesel-Elec.	939,900	6,000	June	*	Electro-Motive
Bingham & Garfield	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	October	*	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	December	December	West.-Baldwin
Boston & Maine	3	B-B	Sw.	Diesel-Elec.	250,000	1,000	March	July	Electro-Motive
	6	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	March	*	Electro-Motive
Central of Georgia	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	July	*	West.-Baldwin
	3	B-B	Sw.	Diesel-Elec.	240,000	1,000	November	*	West.-Baldwin
Chicago & Eastern Illinois	2	B-B	Sw.	Diesel-Elec.	198,000	600	January	June	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	200,000	660	March	August	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	198,000	660	February	August	G. E.-American
Chicago & Northwestern	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	July	*	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	88,000	380	May	.....	West.-Whit.-Cater.
	1	B-B	Sw.	Diesel-Elec.	88,000	380	July	.....	West.-Whit.-Cater.
	1	B-B	Sw.	Diesel-Elec.	198,000	660	February	August	G. E.-American
	3	B-B	Sw.	Diesel-Elec.	230,000	1,000	July	*	G. E.-American
	1	A1A-A1A	Pass.	Diesel-Elec.	313,300	2,000	March	*	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	July	*	Electro-Motive
	3	B-B	Sw.	Diesel-Elec.	198,000	600	July	*	Electro-Motive
Chicago, Burlington & Quincy	15	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	April	*	Electro-Motive
	15	B-B	Sw.	Diesel-Elec.	250,000	1,000	April	*	Electro-Motive

Chicago, Milwaukee, St. Paul & Pac.	4	B-B	Sw.	Diesel-Elec.	230,000	1,000	January	*	G. E.-American
	2	B-B	Rd. & Sw.	Diesel-Elec.	230,000	1,000	September	*	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	January	November	West.-Baldwin
	3	B-B	Sw.	Diesel-Elec.	250,000	1,000	January	*	Electro-Motive
	1	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	January	*	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	February	*	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	February	October	West.-Baldwin
Chicago, Rock Island & Pacific	8	B-B	Sw.	Diesel-Elec.	198,000	600	February	Mar.-Apr.	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	89,000	360	June	June	Dav.-Besler
	4	B-B	Sw.	Diesel-Elec.	230,000	1,000	February	Sept.-Oct.	G. E.-American
	5	B-B	Sw.	Diesel-Elec.	250,000	1,000	February	*	Electro-Motive
	5	B-B	Sw.	Diesel-Elec.	240,000	1,000	May	*	West.-Baldwin
Colorado & Wyoming	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	July	*	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	September	*	West.-Baldwin
Denver & Rio Grande Western	5	B-B	Rd. & Sw.	Diesel-Elec.	88,000	380	May	Sept.-Oct.	G. E.-Cater.
Elgin, Joliet & Eastern	7	B-B	Sw.	Diesel-Elec.	230,000	1,000	June	*	G. E.-American
	7	B-B	Sw.	Diesel-Elec.	240,000	1,000	June	*	West.-Baldwin
Ft. Worth & Denver City	1	B-B	Sw.	Diesel-Elec.	198,000	600	February	August	Electro-Motive
Great Northern	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	February	*	Electro-Motive
	1 ♦	B-B	Rd.	Diesel-Elec.	214,000	1,350	Dec. '41	*	Electro-Motive
	10	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	April	*	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	April	*	Electro-Motive
Gulf, Mobile & Ohio	2 ♦	B-B	Sw.	Diesel-Elec.	230,000	1,000	Dec. '41	September	G. E.-American
	1	A1A-A1A	Pass.	Diesel-Elec.	336,000	2,000	May	September	G. E.-American
Illinois Central	1	2(B-B)	Road	Diesel-Elec.	313,300	2,000	May	*	Electro-Motive
	4	B-B	Sw.	Diesel-Elec.	250,000	1,000	May	*	Electro-Motive
Kansas City Southern	4	B-B	Rd. & Sw.	Diesel-Elec.	230,000	1,000	October	*	G. E.-American
Kentucky & Indiana Terminal	3	B-B	Sw.	Diesel-Elec.	240,000	1,000	January	Aug.-Sept.	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	January	*	West.-Baldwin
Lehigh Valley	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	February	1943	G. E.-American
	4	B-B	Sw.	Diesel-Elec.	230,000	1,000	February	Aug.-Sept.	G. E.-American
	5	B-B	Sw.	Diesel-Elec.	250,000	1,000	February	*	Electro-Motive
	5	B-B	Sw.	Diesel-Elec.	250,000	1,000	July	*	Electro-Motive
	5	B-B	Sw.	Diesel-Elec.	230,000	1,000	July	*	G. E.-American
	5	B-B	Sw.	Diesel-Elec.	230,000	1,000	October	*	G. E.-American
Maine Central (Portland Terminal)	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	July	*	G. E.-American
Minneapolis & St. Louis	2	B-B	Rd. & Sw.	Diesel-Elec.	88,000	380	May	September	G. E.-Cater.
Minneapolis, Northfield & Southern	1	B-B	Sw.	Diesel-Elec.	200,000	660	March	September	West.-Baldwin
Missouri Pacific	4	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	June	*	Electro-Motive
Nashville, Chattanooga & St. Louis	5	B-B	Sw.	Diesel-Elec.	230,000	1,000	February	June-July	G. E.-American
	5	B-B	Sw.	Diesel-Elec.	230,000	1,000	November	*	G. E.-American
Newburgh & South Shore	2	B-B	Sw.	Diesel-Elec.	198,000	660	April	October	G. E.-American
New York Central	6	B-B	Sw.	Diesel-Elec.	198,000	660	February	Sept.-Oct.	G. E.-American
	11	B-B	Sw.	Diesel-Elec.	198,000	660	February	*	G. E.-American
	3	B-B	Sw.	Diesel-Elec.	200,000	660	February	October	West.-Baldwin
	6	B-B	Sw.	Diesel-Elec.	198,000	600	February	Dec.-Jan. '43	Electro-Motive
	4	B-B	Sw.	Diesel-Elec.	198,000	600	February	*	Electro-Motive
	2	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	May	*	Electro-Motive
New York, New Haven & Hartford	10	1B-B1	Pass. & Frt.	Diesel-Elec.	336,000	2,000	January	July-Dec.	G. E.-American
	10	1B-B1	Pass. & Frt.	Diesel-Elec.	336,000	2,000	May	*	G. E.-American
	10	B-B	Sw.	Diesel-Elec.	198,000	660	January	*	G. E.-American
	10	B-B	Sw.	Diesel-Elec.	198,000	660	May	*	G. E.-American
New York, Susquehanna & Western	2	B-B	Rd. & Sw.	Diesel-Elec.	230,000	1,000	September	*	G. E.-American
Northern Pacific	3	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	February	*	Electro-Motive
	4	B-B	Sw.	Diesel-Elec.	230,000	1,000	August	*	G. E.-American
	4	B-B	Sw.	Diesel-Elec.	240,000	1,000	August	*	West.-Baldwin
	2 ♦	B-B	Sw.	Diesel-Elec.	240,000	1,000	Dec. '41	October	West.-Baldwin
	2 ♦	B-B	Sw.	Diesel-Elec.	200,000	660	Dec. '41	March	West.-Baldwin
	1	B-B	Rd. & Sw.	Diesel-Elec.	88,000	410	August	†	G. E.-Buda
Northeast Oklahoma	1	B-B	Frt. & Sw.	Diesel-Elec.	160,000	500	October	Jan. '43	G. E.-Cummins
Pacific Electric	2	B-B	Rd. & Sw.	Diesel-Elec.	88,000	380	November	.....	G. E.-Cater.
Patapsco & Back Rivers	2	B-B	Sw.	Diesel-Elec.	200,000	660	March	March	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	March	August	West.-Baldwin
Pennsylvania	2	B-B	Sw.	Diesel-Elec.	200,000	660	March	August	West.-Baldwin
	6	B-B	Sw.	Diesel-Elec.	200,000	660	March	Sept.-Oct.	West.-Baldwin
	4	B-B	Sw.	Diesel-Elec.	240,000	1,000	March	*	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	May	*	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	200,000	660	March	March	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	198,000	600	January	August	Electro-Motive
Peoria & Pekin Union	1	B-B	Sw.	Diesel-Elec.	200,000	1,000	April	October	G. E.-American
Philadelphia, Bethlehem & New England	2	B-B	Sw.	Diesel-Elec.	198,000	600	1942	1942	Electro-Motive
Pittsburgh & West Virginia	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	May	*	West.-Baldwin
Reading	2	B-B	Sw.	Diesel-Elec.	200,000	660	March	July	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	200,000	660	March	September	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	April	October	West.-Baldwin
	3	B-B	Sw.	Diesel-Elec.	240,000	1,000	April	*	West.-Baldwin
	3	B-B	Sw.	Diesel-Elec.	250,000	1,000	April	*	Electro-Motive
Richmond, Fredericksburg & Potomac	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	May	May '43	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	November	June '43	G. E.-American
St. Louis-San Francisco	2	B-B	Sw.	Diesel Elec.	200,000	660	February	August	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	February	June	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	February	October	West.-Baldwin
	6	B-B	Sw.	Diesel-Elec.	240,000	1,000	February	*	West.-Baldwin
	5	B-B	Sw.	Diesel-Elec.	240,000	1,000	March	*	West.-Baldwin
	5	B-B	Sw.	Diesel-Elec.	240,000	1,000	May	*	West.-Baldwin
	10	B-B	Sw.	Diesel-Elec.	240,000	1,000	August	*	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	88,000	350	April	1942	Dav. Besler
	1	B-B	Sw.	Diesel-Elec.	88,000	380	March	.....	West.-Whit.-Cater.
St. Louis Southwestern	3	B-B	Sw.	Diesel-Elec.	240,000	1,000	July	July-Nov.	West.-Baldwin
	3	B-B	Sw.	Diesel-Elec.	240,000	1,000	1942	*	West.-Baldwin
San Francisco & Napa Valley	2	B-B	Rd. & Sw.	Diesel-Elec.	88,000	380	February	April	G. E.-Cater.
Seaboard Air Line	2	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	February	*	Electro-Motive
	1	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	April	*	Electro-Motive
	5	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	October	*	Electro-Motive
	5	B-B	Sw.	Diesel-Elec.	250,000	1,000	February	June-July	Electro-Motive
Southern	2	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	January	*	Electro-Motive
	1	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	March	*	Electro-Motive
	1	2(A1A-A1A)	Pass. & Frt.	Diesel-Elec.	672,000	4,000	March	September	G. E.-American
(C. N. O. & T. P.)	1	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	April	*	Electro-Motive
Southern Pacific	30	B-B	Sw.	Diesel-Elec.	230,000	1,000	March	*	G. E.-Ameicran
Spokane, Portland & Seattle	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	February	August	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	January	September	West.Baldwin-
Terminal Ry., Alabama State Docks	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	May	*	G. E.-American
Union	14	B-B	Sw.	Diesel-Elec.	230,000	1,000	April	*	G. E.-American
Wabash	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	July	*	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	April	*	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	October	*	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	July	*	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	198,000	660	April	*	G. E.-American
Western Maryland	3	B-B	Sw.	Diesel-Elec.	200,000	660	March	July-Sept.	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	July	*	West.-Baldwin
Western Pacific	3	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	July	*	Electro-Motive
	8	B-B	Sw.	Diesel-Elec.	230,000	1,000	November	*	G. E.-American
Youngstown & Northern	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	January	April	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	January	August	G. E.-American

Industrial and Private Car Line Orders—For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of Order	Date of Delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Alabama Drydock & Shipbuilding Company	3 ♦	B	Sw.	Diesel-Mech.	50,000	180	Nov. '41	Feb.-Mar.	Fate. Root. Heath-Cater
	1	B-B	Sw.	Diesel-Elec.	100,000	300	January	April	West.-F. R. H.-Cummins
Alabama, Tennessee & Northern	1	B-B	Sw.	Diesel-Elec.	160,000	500	March	May	G. E.-Cummins
Aluminum Co. Plant (Torrance, Cal.)	1	B-B	Sw.	Diesel-Elec.	130,000	400	April	October	G. E.-Cummins
American Car & Foundry Co.	2	B-B	Sw.	Diesel-Elec.	90,000	300	January	February	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	February	May	G. E.-Cummins
	1	B	Sw.	Gas.-Mech.	70,000	250	January	April	Fate. R. H.-LeRoi
	1 ♦	B	Sw.	Gas.-Mech.	70,000	250	Aug. '41	January	Fate. R. H.-LeRoi
	1	B	Sw.	Gas.-Mech.	36,000	150	September	.....	Fate. R. H.-LeRoi
American Potash & Chemical Corp.	1	B	Sw.	Diesel-Elec.	50,000	150	January	January	G. E.-Cummins
American Rolling Mills	1	B-B	Sw.	Diesel-Elec.	160,000	500	July	†	G. E.-Cummins
American Steel & Wire Co.	1	B-B	Sw.	Diesel-Elec.	200,000	660	June	July	West.-Baldwin
American Steel Foundries	2	B-B	Sw.	Diesel-Elec.	130,000	400	March	October	G. E.-Whit.-Cummins
	1	B	Sw.	Diesel-Mech.	70,000	250	March	September	Whitcomb-Cummins
Andrews Steel	1	B-B	Sw.	Diesel-Elec.	130,000	400	October	†	G. E.-Cummins
Appalachian Electric Power Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	September	†	G. E.-Cummins
Arlington Mills	1	B	Sw.	Diesel-Elec.	50,000	150	September	October	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	September	†	G. E.-Cummins
Arundel Corporation	3	B	Sw.	Diesel-Mech.	60,000	193	July	.....	Whitcomb-Hercules
Babcock & Wilcox Tube Co.	1	B-B	Sw.	Diesel-Elec.	130,000	400	May	†	G. E.-Cummins
Badger, E. B., & Son	3	B-B	Sw.	Diesel-Elec.	160,000	500	April	August	G. E.-Cummins
(W. Va. Ord.)	6	B-B	Sw.	Diesel-Elec.	90,000	300	June	†	G. E.-Cummins
(W. Va. Ord.)	2	B-B	Sw.	Diesel-Elec.	160,000	500	June	†	G. E.-Cummins
(Plum Brook)	2	B-B	Sw.	Diesel-Elec.	90,000	300	July	†	G. E.-Cummins
Basic Magnesium, Inc. (D. P. C.)	1	B-B	Sw.	Diesel-Elec.	200,000	660	February	April	West.-Baldwin
Bechtel, W. A., Co.	1	B	Sw.	Diesel-Elec.	50,000	150	April	July	G. E.-Cummins
Bell Air Craft	1	B	Sw.	Gas.-Mech.	60,000	175	March	May	Fate. R. H.-LeRoi
Bethlehem Steel Co.	5	B-B	Sw.	Diesel-Elec.	100,000	300	May	†	G. E.-Cummins
(Seattle, Wash.)	2	B	Sw.	Diesel-Elec.	50,000	150	April	July	G. E.-Cummins
(Los Angeles, Cal.)	1	B	Sw.	Diesel-Elec.	50,000	150	April	†	G. E.-Cummins
(San Francisco, Cal.)	1	B	Sw.	Diesel-Elec.	50,000	150	April	October	G. E.-Cummins
(Fairfield Shipyd.)	1	B-B	Sw.	Diesel-Elec.	90,000	300	September	September	G. E.-Cummins
(Alameda Shipyd.)	1	B-B	Sw.	Diesel-Elec.	90,000	300	March	April	G. E.-Cummins
(Alameda Shipyd.)	1	B	Sw.	Diesel-Elec.	50,000	150	June	September	G. E.-Cummins
	2	B	Sw.	Diesel-Elec.	100,000	300	May	.....	West.-Whit.-Cummins
	1	B	Sw.	Diesel-Mech.	60,000	190	November	.....	Whitcomb-Cater.
Bickel, Henry, Co.	1	B	Sw.	Diesel-Elec.	50,000	150	April	June	G. E.-Cummins
	1	B	Sw.	Diesel-Elec.	50,000	150	July	September	G. E.-Cummins
Broward County Port Authority	1	B-B	Sw.	Diesel-Elec.	160,000	500	November	†	G. E.-Cummins
Brown Shipbuilding Corp.	1	B	Sw.	Diesel-Mech.	60,000	190	March	May	Whitcomb-Cater.
Brunswick Marine Const. Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	May	October	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	April	.....	West.-Whit.-Cummins
Budd, Edw. G., Mfg. Co.	1	B	Sw.	Diesel-Mech.	32,000	132	June	October	Fate. Root. Heath-Cater.
Byrne Organization (Norfolk, Va.)	2	B-B	Sw.	Diesel-Elec.	90,000	300	January	February	G. E.-Cummins
Carnegie-Illinois Steel Corp.	1	B-B	Road	Diesel-Elec.	88,000	380	October	†	G. E.-Cater.
	1 ♦	B	Sw.	Gas.-Mech.	70,000	250	Dec. '41	April	Fate. R. H.-LeRoi
	1	B	Sw.	Gas.-Mech.	70,000	250	May	October	Fate. R. H.-LeRoi
Carolina Aluminum Co.	1	B-B	Sw.	Diesel-Elec.	130,000	400	April	†	G. E.-Cummins
Certainteed Products Corp.	1	B-B	Sw.	Diesel-Elec.	90,000	300	March	May	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	130,000	400	March	September	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	130,000	400	May	†	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	160,000	500	May	†	G. E.-Cummins
Chemical Construction Corp.	1	B-B	Sw.	Diesel-Elec.	90,000	300	May	October	G. E.-Cummins
Chris Craft Corp.	1	C	Sw.	Gas.-Mech.	60,000	175	April	July	Fate. R. H.-LeRoi
Colorado Fuel & Iron Corp.	2	B	Sw.	Diesel-Elec.	50,000	150	August	Sept.-Oct.	G. E.-Cummins
Columbia Steel Co.	1	B	Sw.	Diesel-Elec.	50,000	150	July	September	G. E.-Cummins
Concan Ordnance Company	2	B-B	Sw.	Diesel-Elec.	130,000	400	June	†	G. E.-Cummins
Continental Roll & Steel Co.	1	B-B	Sw.	Diesel-Elec.	100,000	400	April	September	West.-Whit.-Buda
Curtiss Wright Corp.	1	B	Sw.	Diesel-Elec.	50,000	150	June	†	G. E.-Cummins
	1	B	Sw.	Diesel-Elec.	50,000	150	September	†	G. E.-Cummins
Day & Zimmerman, Inc.	2	B-B	Road	Diesel-Elec.	88,000	380	January	Feb.-Mar.	G. E.-Cater.
	1 ♦	B	Sw.	Gas.-Mech.	32,000	150	Dec. '41	January	Fate. Root. Heath-Buda
Defense Plant Corporation (Alcoa-Jones Mills)	1	B	Sw.	Diesel-Elec.	50,000	150	March	June	G. E.-Cummins
Dow Chemical Company	2	B-B	Sw.	Diesel-Elec.	130,000	400	May	†	G. E.-Cummins
DuPont de Nemours, E. I., Co.									
(Dana, Ind.)	1	B-B	Sw.	Diesel-Elec.	160,000	500	January	June	G. E.-Cummins
(Dana, Ind.)	1	B-B	Sw.	Diesel-Elec.	130,000	380	January	May	G. E.-Hercules
(Copper Ord.)	2	B-B	Sw.	Diesel-Elec.	130,000	380	May	October	G. E.-Hercules
(Oklahoma Ord.)	2	B-B	Sw.	Diesel-Elec.	130,000	380	May	†	G. E.-Hercules
(Alabama Ord.)	1	B-B	Sw.	Diesel-Elec.	130,000	380	May	†	G. E.-Hercules
(Oklahoma Ord.)	1	B-B	Sw.	Diesel-Elec.	160,000	500	May	†	G. E.-Cummins
(Louisville, Ky.)	1	B	Sw.	Diesel-Elec.	50,000	150	June	September	G. E.-Cummins
(Gopher Ord.)	1	B-B	Sw.	Diesel-Elec.	160,000	500	July	†	G. E.-Cummins
(Wabash Ord.)	1	B-B	Sw.	Diesel-Elec.	130,000	400	August	†	G. E.-Cummins
	1 ♦	B	Sw.	Diesel-Elec.	36,000	132	Aug. '41	February	Fate. Root. Heath-Cater.
Dravo Corporation	1	B	Sw.	Diesel-Mech.	60,000	180	July	August	Fate. Root. Heath-Cater.
	3	B	Sw.	Diesel-Mech.	40,000	193	March	July-Aug.	Whitcomb-Hercules
Duval Texas Sulphur Co.	1	B	Sw.	Diesel-Mech.	60,000	190	October	.....	Whitcomb-Cater.
Electro-Metallurgical Co.	2	B-B	Sw.	Diesel-Elec.	160,000	500	June	.....	G. E.-Whit.-Cummins
Federal Cartridge Co.	2 ♦	B-B	Sw.	Diesel-Elec.	88,000	300	Oct. '41	June	West.-F. R. H.-Cummins
Federal Shipbldg. & Dry Dock Co.	1	B	Sw.	Diesel-Elec.	50,000	150	February	April	G. E.-Cummins
Ferguson, H. K., Co.	1	B	Sw.	Gas.-Mech.	60,000	175	October	.....	Fate. R. H.-LeRoi
(Wells Pit)	1	B	Sw.	Diesel-Elec.	50,000	150	May	†	G. E.-Cummins
Ford, Bacon & Davis	1	B-B	Sw.	Diesel-Elec.	160,000	500	January	June	G. E.-Cummins
	1	B	Sw.	Diesel-Elec.	50,000	150	September	†	G. E.-Cummins
	1 ♦	B	Sw.	Diesel-Mech.	60,000	180	Nov. '41	September	Fate. Root. Heath-Cater.
(Longhorn)	2	B-B	Sw.	Diesel-Elec.	130,000	400	March	July	G. E.-Cummins
(Elec. Boat Co.)	1	B-B	Sw.	Diesel-Elec.	90,000	300	June	July	G. E.-Cummins
Fraser Brace Engineering Co.	2	B-B	Sw.	Diesel-Elec.	90,000	300	January	March	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	160,000	500	January	July	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	February	March	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	160,000	500	February	June	G. E.-Cummins
Fuller, George A., Co.	1	B	Sw.	Diesel-Mech.	70,000	180	August	.....	Fate. Root. Heath-Cater.
General Electric Company	1	B-B	Sw.	Diesel-Elec.	90,000	300	February	April	G. E.-Cummins
	1	B	Sw.	Diesel-Elec.	50,000	150	October	†	G. E.-Cummins
General Steel Castings Corp.	2	B-B	Sw.	Diesel-Elec.	90,000	300	March	October	West.-Whit.-Cummins
Gilbert & Barker Mfg. Co.	1	B	Sw.	Diesel-Elec.	50,000	150	May	September	G. E.-Cummins
Granite City Steel	1	B-B	Roa	Diesel-Elec.	88,000	380	August	†	G. E.-Cater.
	3	B	Sw.	Diesel-Mech.	50,000	190	August	Mar. '43	Dav. Besler-Cater.
Great Lakes Carbon Corp.	1	B	Sw.	Gas.-Mech.	60,000	190	April	September	Whitcomb-LeRoi
Hercules Powder Company	1	B-B	Sw.	Diesel-Elec.	160,000	500	February	August	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	160,000	500	March	October	G. E.-Cummins
(Sunflower Ord.)	2	B-B	Sw.	Diesel-Elec.	160,000	500	May	†	G. E.-Cummins
Holston Ordnance Works	3	B-B	Sw.	Diesel-Elec.	90,000	300	July	†	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	160,000	500	July	†	G. E.-Cummins
Houston Shipbuilding Corp.	1	B-B	Sw.	Diesel-Elec.	100,000	300	January	June	West.-Whit.-Cummins
	1	B	Sw.	Diesel-Mech.	60,000	190	January	May	Whitcomb-Cater.
Hudson Motor Car Company	1	B	Sw.	Diesel-Elec.	50,000	150	January	February	G. E.-Cummins
Hughes Tool Company	1	B	Sw.	Diesel-Mech.	40,000	193	April	August	Whitcomb-Hercules
Inland Steel Company	1	C	Sw.	Diesel-Mech.	140,000	340	February	August	Fate. R. H.-Coop. Bess.

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of Order	Date of Delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
International Minerals & Chem. Corp.	1	B	Sw.	Diesel-Elec.	50,000	150	April	August	G. E.-Cummins
Jones & Laughlin Steel Corp.	1	B	Sw.	Diesel-Mech.	50,000	180	February	November	Fate. Root. Heath-Cater.
Kaiser Company	1	B	Sw.	Diesel-Elec.	50,000	150	February	May	G. E.-Cummins
	3	B	Sw.	Diesel-Elec.	50,000	150	March	May-June	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	June	†	G. E.-Cummins
	3	B-B	Sw.	Diesel-Elec.	160,000	500	June	†	G. E.-Cummins
Kellogg, M. W., Company	1	B	Sw.	Diesel-Mech.	50,000	180	February	June	Fate. Root. Heath-Cater.
Kershaw ButlerEngineering Co.	1	B-B	Sw.	Diesel-Elec.	130,000	400	February	June	G. E.-Cummins
(Huntsville)	1	B-B	Sw.	Diesel-Elec.	130,000	400	April	†	G. E.-Cummins
Walter Kidde Constructors, Inc.	1	B	Sw.	Diesel-Elec.	50,000	150	May	†	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	May	July	G. E.-Cummins
Lawrence Portland Cement Co.	1	B	Sw.	Gas.-Mech.	50,000	175	February	.....	Fate. R. H.-LeRoi
Linde Air Products	1	B	Sw.	Gas.-Mech.	60,000	216	September	December	Dav. Besler-Climax
Lion Chemical Corp.	1	B-B	Sw.	Diesel-Elec.	90,000	300	May	October	G. E.-Cummins
Lone Star Defense Corp.	1	B-B	Sw.	Diesel-Elec.	130,000	400	July	†	G. E.-Cummins
Louisiana & Northwestern	2	B-B	Sw.	Diesel-Elec.	160,000	650	May	Feb. '43	West.-Whit.-Buda
Louisiana Shipyards	1	B	Sw.	Diesel-Mech.	50,000	180	March	August	Fate. Root. Heath-Cater.
Lummus Company	1	B-B	Sw.	Diesel-Elec.	100,000	300	June	†	G. E.-Cummins
(Maumelle Ord.)	1	B-B	Sw.	Diesel-Elec.	90,000	300	July	†	G. E.-Cummins
Marietta Air Craft	1	B	Sw.	Gas.-Mech.	60,000	175	March	May	Fate. R. H.-LeRoi
Marietta Manufacturing Co.	2	B-B	Sw.	Diesel-Elec.	90,000	300	May	June-July	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	May	†	G. E.-Cummins
Massena Terminal	1	B-B	Sw.	Diesel-Elec.	198,000	660	May	September	G. E.-American
Mesta Machine Co.	1	B-B	Sw.	Diesel-Elec.	130,000	400	November	.....	G. E.-Whit.-Cummins
Midland Ordnance Foundation (Oak. Ord.)	2	B-B	Sw.	Diesel-Elec.	160,000	500	June	†	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	90,000	300	May	November	West.-Whit.-Cummins
	6	B-B	Sw.	Diesel-Elec.	90,000	300	May	.....	West.-Whit.-Cummins
Midvale Company, The	1	B	Sw.	Diesel-Elec.	100,000	320	March	.....	West.-Whit.-Hercules
	1	B	Sw.	Diesel-Elec.	100,000	320	June	.....	West.-Whit.-Hercules
Missouri Portland Cement	1	B-B	Sw.	Diesel-Elec.	100,000	300	May	.....	West.-Whit.-Cummins
Monessen Southwestern	1	B-B	Sw.	Diesel-Elec.	130,000	400	August	Apr. '43	West.-Porter-Cummins
	1	B-B	Sw.	Diesel-Elec.	130,000	400	August	Apr. '43	West.-Porter-Cummins
Monsanto Chemical Co.	1	B	Sw.	Gas.-Mech.	30,000	150	November	.....	Fate. Root. Heath-Buda
Monterrey Iron & Steel Co.	1	B-B	Sw.	Diesel-Elec.	130,000	400	February	.....	G. E.-Whit.-Cummins
	1	B	Sw.	Diesel-Mech.	50,000	190	November	.....	Whitcomb-Cater.
National Gypsum Company	2	B-B	Sw.	Diesel-Elec.	90,000	300	February	June	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	130,000	400	February	August	G. E.-Cummins
(Bluebonnet Ord.)	4	B-B	Sw.	Diesel-Elec.	130,000	400	May	†	G. E.-Cummins
National Malleable & Steel Castings Corp.	1	B	Sw.	Gas.-Mech.	70,000	250	June	.....	Fate. R. H.-LeRoi
Nebraska Defense Corp.	1	B-B	Sw.	Diesel-Elec.	160,000	500	April	September	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	88,000	300	March	.....	West.-Whit.-Cummins
New Departure	1	B	Sw.	Gas.-Mech.	36,000	150	April	July	Fate. Root. Heath-Buda
Newort News Shipbuilding & Drydock	1	B	Sw.	Diesel-Elec.	100,000	300	March	October	West.-Whit.-Cummins
New York Air Brake Co.	1	B	Sw.	Diesel-Elec.	50,000	150	July	September	G. E.-Cummins
North Carolina Shipbldg. Co.	2	B-B	Sw.	Diesel-Elec.	90,000	300	February	April	G. E.-Cummins
Northwestern Improvement Co.	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	July	*	West.-Baldwin
Oil Well Supply Co.	1	B	Sw.	Gas.-Mech.	80,000	250	March	November	Whitcomb-LeRoi
Oliver Iron Mining Co.	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	January	July	West.-Baldwin
Pennsylvania Shipyards	1	B	Sw.	Diesel-Elec.	50,000	150	January	January	G. E.-Cummins
	1	B	Sw.	Diesel-Elec.	50,000	150	October	†	G. E.-Cummins
Phelps Dodge Corp.	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	December	December	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	December	December	Electro-Motive
Pittsburgh Metallurgical	1	B	Sw.	Diesel-Elec.	50,000	150	September	September	G. E.-Cummins
Pittsburgh Steel Co.	2	B-B	Sw.	Diesel-Elec.	130,000	400	October	.....	G. E.-Whit.-Cummins
	1	B	Sw.	Diesel-Elec.	65,000	200	March	.....	West.-Porter-Cummins
Pressed Steel Car Co.	1	B	Sw.	Gas.-Mech.	24,000	100	March	May	Fate. R. H.-Climax
Procter & Gamble (Prairie, Miss.)	2	B-B	Sw.	Diesel-Elec.	90,000	300	May	October	G. E.-Cummins
(Gulf Ordnance)	2	B-B	Sw.	Diesel-Elec.	160,000	500	June	†	G. E.-Cummins
Pusey & Jones	1	B	Sw.	Gas.-Mech.	36,000	150	February	March	Fate. Root. Heath-Buda
Quaker Oats Ordnance	5	B-B	Sw.	Diesel-Elec.	90,000	300	May	June-Aug.	G. E.-Cummins
Raymond Concrete Pile Co.	1	B	Sw.	Gas.-Mech.	70,000	250	July	.....	Fate. R. H.-LeRoi
Remington Rand (Sangamon Ord.)	3	B-B	Sw.	Diesel-Elec.	90,000	300	April	Aug.-Sept.	G. E.-Cummins
Republic Mining & Mfg. Co.	1	B	Sw.	Diesel-Mech.	40,000	193	July	November	Whitcomb-Hercules
	3	B	Sw.	Diesel-Mech.	40,000	193	July	.....	Whitcomb-Hercules
Republic Steel Corp.	2 ♦	C	Sw.	Diesel-Mech.	130,000	340	Sept.-Oct.'41	Feb.-Mar.	Fate. R. H.-Coop. Bess.
	5	C	Sw.	Diesel-Mech.	130,000	340	May	Oct.-Dec.	Fate. R. H.-Coop. Bess.
	2	B-B	Sw.	Diesel-Elec.	198,000	600	1942	1942	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	1942	1942	Electro-Motive
Richmond Shipbuilding	1	B	Sw.	Diesel-Elec.	50,000	150	April	July	G. E.-Cummins
Ridgewood Steel Co.	1	B	Sw.	Gas.-Mech.	32,000	150	January	February	Fate. Root. Heath-Buda
Rust Engineering Co.	2	B-B	Sw.	Diesel-Elec.	90,000	300	April	June	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	88,000	380	April	May	G. E.-Cater.
(Kentucky Ord.)	1	B-B	Sw.	Diesel-Elec.	160,000	500	May	†	G. E.-Cummins
Sanderson & Porter	2	B-B	Sw.	Diesel-Elec.	160,000	500	April	†	G. E.-Cummins
(Pinebluff, Ark.)	2	B-B	Sw.	Diesel-Elec.	90,000	300	January	February	G. E.-Cummins
(Pinebluff, Ark.)	1	B-B	Sw.	Diesel-Elec.	130,000	400	January	June	G. E.-Cummins
(Pinebluff, Ark.)	1	B-B	Sw.	Diesel-Elec.	160,000	500	March	October	G. E.-Cummins
(Pinebluff, Ark.)	1	B-B	Sw.	Diesel-Elec.	160,000	500	August	†	G. E.-Cummins
Scullin Steel Co.	1	B	Sw.	Diesel-Elec.	100,000	320	March	October	West.-Whit.-Hercules
	1	B-B	Sw.	Diesel-Elec.	130,000	400	March	.....	West.-Whit.-Cummins
Seattle-Tacoma Shipbuilding	1	B	Sw.	Diesel-Mech.	40,000	193	March	May	Whitcomb-Hercules
Sheffield Steel Corp.	2	B	Sw.	Diesel-Elec.	100,000	320	April	.....	West.-Whit.-Hercules
Silas Mason Company	1	B-B	Sw.	Diesel-Elec.	130,000	400	February	June	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	90,000	300	May	†	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	130,000	400	May	†	G. E.-Cummins
Southeastern Shipbuilding Co.	2	B-B	Sw.	Diesel-Elec.	90,000	300	March	November	West.-Whit.-Cummins
Stewart Warner Corp.	3	B-B	Sw.	Diesel-Elec.	90,000	300	April	Sept.-Oct.	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	90,000	300	April	†	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	160,000	500	August	†	G. E.-Cummins
Stone & Webster Engr. Co.	1	B-B	Sw.	Diesel-Elec.	160,000	500	April	October	G. E.-Cummins
(Pennsylvania Ord.)	1	B-B	Sw.	Diesel-Elec.	130,000	400	April	October	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	90,000	300	March	Aug.-Oct.	West.-F. R. H.-Cummins
	2	B-B	Sw.	Diesel-Elec.	160,000	500	April	.....	G. E. Whit.-Cummins
Tennessee Coal, Iron & R. R. Co.	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	September	October	G. E.-American
Tennessee Corporation	1	B	Sw.	Gas.-Mech.	30,000	150	October	.....	Fate. Root. Heath-Buda
Tennessee Valley Authority	1	B-B	Sw.	Diesel-Elec.	90,000	300	January	April	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	130,000	400	February	July	G. E.-Cummins
	3	B	Sw.	Diesel-Elec.	50,000	150	March	July-Aug.	G. E.-Cummins
	2	B	Sw.	Gas.-Mech.	36,000	150	March	July	Fate. Root. Heath-Buda
Texasteel Manufacturing Co.	1	B	Sw.	Diesel-Elec.	50,000	150	July	September	G. E.-Cummins
Tonowanda Iron Corporation	1	B-B	Sw.	Diesel-Elec.	90,000	300	June	†	G. E.-Cummins
Townsco Equipment Co.	1	B	Sw.	Gas.-Mech.	60,000	175	February	March	Fate. R. H.-LeRoi
	1	B	Sw.	Gas.-Mech.	60,000	175	May	August	Fate. R. H.-LeRoi
Truax Traer Coal Company	1	B-B	Sw.	Diesel-Elec.	130,000	400	May	October	G. E.-Cummins
Turner Construction Co.	1	B	Sw.	Diesel-Mech.	50,000	190	May	October	Whitcomb-Cater.
United Aircraft Co. of Missouri	1	B	Sw.	Diesel-Elec.	46,000	150	September	.....	West.-Whit.-Cummins
United Engineering & Foundry Co.	1	B-B	Sw.	Diesel-Elec.	160,000	500	April	†	G. E.-Cummins
	1	B	Sw.	Gas.-Mech.	70,000	250	June	August	Fate. R. H.-LeRoi
	1	B	Sw.	Gas.-Mech.	70,000	250	October	.....	Fate. R. H.-LeRoi
United States Rubber Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	May	†	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	May	August	G. E.-Cummins

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of Order	Date of Delivery	Builder Electrical Equipment Locomotive Builder-Engine Builder
	1	B-B	Road	Diesel-Elec.	88,000	380	May	August	G. E.-Cater.
	1	B-B	Sw.	Diesel-Elec.	90,000	300	July	October	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	90,000	300	July	†	G. E.-Cummins
	1	B	Sw.	Diesel-Mech.	70,000	180	September	September	Fate. Root. Heath-Cater
Virginia Engineering Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	September	†	G. E.-Cummins
Vulcan Detinning Co.	1	C	Sw.	Gas.-Mech.	70,000	250	August	August	Fate. R. H.-LeRoi
Youngstown Sheet & Tube Co.	1	B	Sw.	Gas.-Mech.	50,000	175	January	June	Fate. R. H.-LeRoi

♦1941 totals have been adjusted to include these cars which were not reported last year.
Note:—Information as to whether or not locomotives were authorized for building by the War Production Board is shown in "Date of Delivery" column. Locomotives delivered prior to April, 1942, required no WPB authorization. Locomotives delivered subsequent to April, 1942, or shown as scheduled for delivery in 1943, have been authorized. Locomotives ordered but without WPB authority to build are marked with an asterisk (*). Locomotives for which this information was not readily available at time of publication are marked with a dagger (†). Where no date or symbol is shown, locomotives are authorized, but definite delivery date has not been set.

Export

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of Order	Date of Delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Aluminum Co. of Canada	8	B-B	Sw.	Diesel-Elec.	70,000	386	August	.....	West.-Whit.-Hercules
	2	B-B	Sw.	Diesel-Elec.	90,000	300	March	June	G. E.-Cummins
Canadian Furnace	1	B	Sw.	Diesel-Mech.	70,000	250	July	Jan. '43	Dav. Besler-Cummins
Canadian Government	1	C	Sw.	Diesel-Mech.	70,000	250	September	Feb. '43	Dav. Besler-Cummins
Canadian Pacific	5	B-B	Sw.	Diesel-Elec.	230,000	1,000	May	1943	G. E.-American
Kaiser Co., Inc. (Vancouver)	2	B	Sw.	Diesel-Elec.	50,000	150	January	January	G. E.-Cummins
	1	B	Sw.	Diesel-Elec.	50,000	150	January	April	G. E.-Cummins
Leste Braciliere, Brazil:	8	B-B	Sw.	Diesel-Elec.	90,000	380	December	1943	West.-Dav. Besler-Cater
Nicaro Nickel Co. (Cuba)	1	B-B	Sw.	Diesel-Elec.	90,000	300	May	October	G. E.-Cummins

Equipment Prices

INFORMATION on equipment prices as published regularly in the Annual Review and Outlook Issue of this paper is obtained, primarily, from I. C. C. orders authorizing the issuance of equipment trust certificates. These orders usually identify the equipment covered by the trust, and reveal its unit price—but they do not go very far in describing it. These I. C. C. equipment trust orders are compared by *Railway Age* with descriptive information it has from other sources. Where an I. C. C. description of equipment of which prices are revealed can be identified with reasonable certainty with more detailed information from other sources, the data are collated in the tables published here.

It will be appreciated that identification between I. C. C. data and that available elsewhere is possible with only part of the orders. Such identification was possible, this year, in even fewer instances than usual, because of the element of confusion introduced by revision of orders to accord with WPB rulings. Such data as are available and are herewith presented are, therefore, fragmentary—but will prove useful for those who will be wary of their limitations and lack of dependable representative character.

* * *

Freight Car Prices

No.	Type	Construction	Capacity Lb.	Unit Price
1,000	hopper	steel	100,000	$2,552
500	hopper	steel	140,000	3,680
250	flat	steel-fr.	140,000	3,477
1,000	comp. gondola	steel-fr.	100,000	2,867
475	box	steel-fr. cast st. truck	100,000	3,220
25	box	steel-fr. allied cast truck	100,000	3,620
500	gondola	steel-fr., sides & ends, wood fl.	140,000	2,628
500	gondola	"	140,000	2,687
250	flat	steel-fr. wood fl.	100,000	3,129
500	hopper	composite	100,000	2,750
500	gondola	composite	140,000	2,940
500	gondola	composite	100,000	2,900
1,100	H.S.gondola	steel-fr.	110,000	2,350
300	flat	steel	140,000	3,043

Locomotive Prices

No.	Type	Service	Weight Lb.	Tractive Force—lb. or hp.	Unit Price
15	0-8-0	Sw.	244,000	57,200	$83,138
5	2-6 & 6-2 (elec.)	Frt.	500,000	4,900 hp.	307,200
10	2-4-4-2	Frt. & Pass.	300,000	2,000 hp.	172,838
10	2-4-4-2	Frt. & Pass.	300,000	2,000 hp.	173,894
12	4-6-6-4	Frt.	643,000	106,890	270,599
3	Diesel-Elec.	Frt.	876,000	5,400 hp.	482,702
2	Diesel-Elec.	Sw.	250,000	1,000 hp.	79,274
2	0-4-4-0	Sw.	236,900	1,000 hp.	78,702
2	0-4-4-0	Sw.	197,800	660 hp.	59,912
49	2-10-4	Frt.	.....	108,250	175,000
5	4-6-0/4-6-0	Pass.	468,400	4,620 hp.	280,000
25	4-8-2	Frt.	398,000	59,850	185,538
17	B-B	Sw.	200,000	600 hp.	60,205
10	B-B	Sw.	198,000	600 hp.	59,750
3	B-B	Sw.	215,000	600 hp.	61,346
2	B-B	Frt.	903,000	5,400 hp.	499,931

The Passenger Station and General Offices of the Central Vermont at St. Albans, Vt.

Passenger-Train Cars in 1942

No new passenger cars authorized during year—Deliveries completed on 207 domestic cars and 11 for export

By Arthur J. McGinnis

Associate Editor

NO new passenger-train cars were authorized for building by the War Production Board during 1942 due to its unwillingness to permit scarce materials to be used for the construction of this equipment. This policy was in accordance with a general ruling late in 1941 by the former Supply, Priorities and Allocations Board (supplanted in January, 1942, by the WPB) diverting these materials to other purposes. The only domestic railway order reported to the *Railway Age* during the year comprised two 70-ft. steel baggage-express cars placed by the Atlanta & West Point and Western of Alabama in April with the American Car & Foundry Co.

Cancellations reported by railroads of orders previously placed in 1941, due to the government's restrictions on building, included five 80-ft. 3-in., 134-passenger steel frame double-deck motor cars and five 80-ft. 3-in., 130-passenger steel frame double-deck trailer cars ordered by the Long Island from its own shops; three 85-ft., 56-passenger air-conditioned coaches ordered by the Louisville & Nashville from the Edward G. Budd Manufacturing Company; one 85-ft. 56-passenger coach ordered by the Nashville, Chattanooga & St. Louis from the Edward G. Budd Manufacturing Company; and twelve 85-ft., 60 passenger air-conditioned coaches ordered by the Pennsylvania from the Edward G. Budd Manufacturing Company, and two 85-ft., 88-passenger air-conditioned coaches ordered by this same railroad from its own shops.

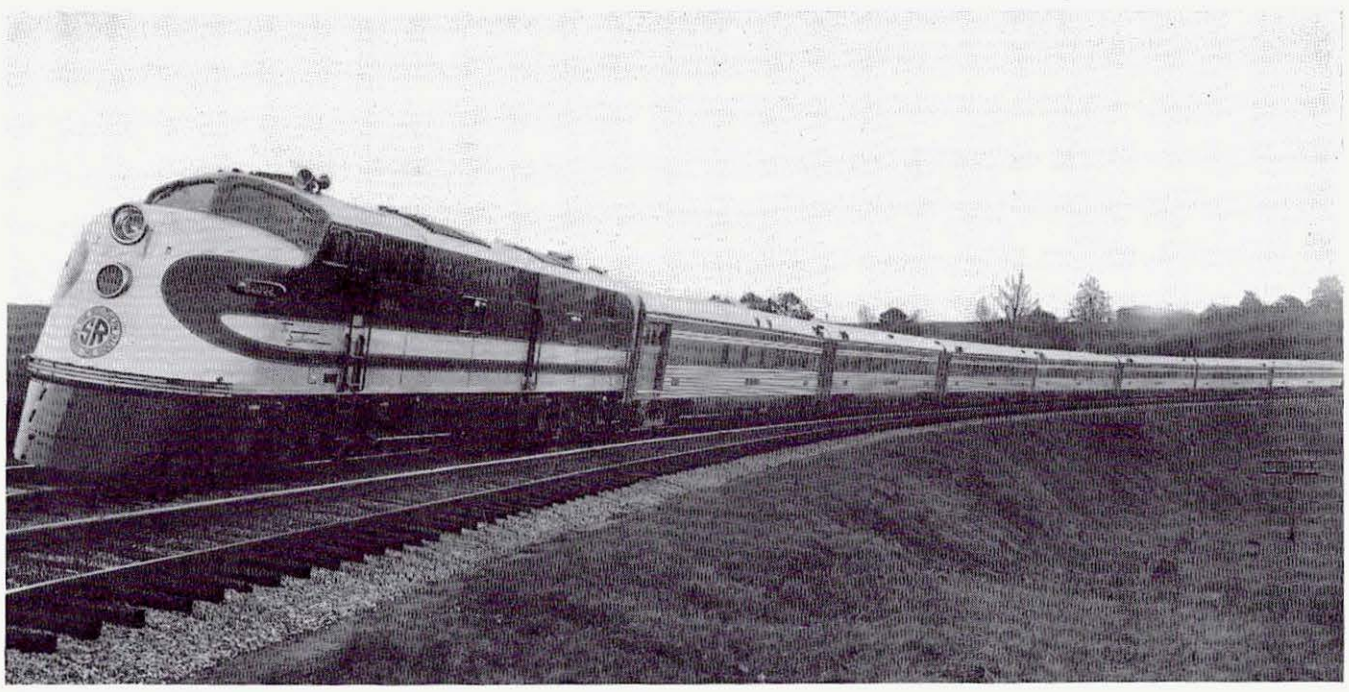
As reported to the *Railway Age,* deliveries were completed during the year on 242 cars for domestic service, including 207 by contract car builders and 35 by railroad companies' shops, and on 11 cars for export. Canadian builders reported completion of 40 cars during the year. Deliveries during the preceding years, 1929-1941, inclusive, are set forth in the accompanying table.

Passenger-Train Cars Built, 1929-1942

Year	Domestic	U. S. Export	Total U. S.	Canadian
1942	242	11	253	40
1941	299	8	307	32
1940	142	28	170	30
1939	194	...	194	27*
1938	264	...	264	38
1937	664	...	664	70
1936	142	...	142	10
1935	197	...	197	...
1934	268	15	283	...
1933	6	...	6	...
1932	39	...	39	...
1931	198	21	219	66
1930	1,264	40	1,304	210
1929	1,254	20	1,274	162

* Includes export deliveries.

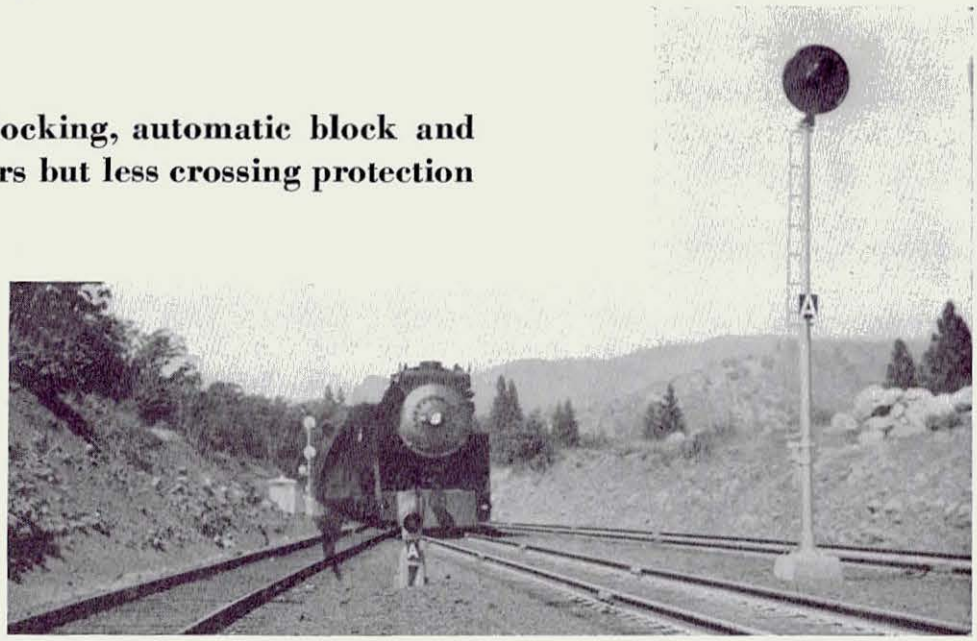
No new passenger cars are expected to be authorized for building during 1943. Neither the Association of American Railroads nor the Office of Defense Transportation has asked for new cars and the War Production Board, in announcing its equipment building program for the first six and eight months of 1943 on November 19, 1942, made no provision for passenger car construction.



Signaling Construction in 1942

More interlocking, automatic block and car retarders but less crossing protection

By John H. Dunn
Signaling Editor



More C.T.C. Was Placed In Service During 1942 Than In Any Previous Year

EXCLUDING highway crossing protection, the railroads of the United States and Canada installed more signaling facilities in 1942 than in any of the previous 10 years, a total of 5,084 signaling units being placed in service during 1942, as compared with 4,351 in 1941, and 4,253 in 1940. Three freight classification yards were equipped with power switches and car retarders during 1942, whereas no such projects were placed in service during the previous year. Automatic block signaling construction increased slightly, and interlocking increased about 10 per cent, while the construction of centralized traffic control was 49 per cent more in 1942 than in 1941, and 160 per cent more than in 1940. On the other hand, less than half as much highway crossing protection was installed in 1942 than in the previous year.

Using materials on hand, the vast majority of the highway crossing protection projects placed in service during 1942 were finished early in the year. On account of the decided decrease in highway traffic as a result of rubber conservation and gasoline rationing, the War Production Board adopted the policy of not allocating material for crossing protection projects except for crossings in the vicinity of camps or war industries where traffic had increased. In some instances, even when materials were on hand, orders were issued to postpone construction, and to release the insulated wire and cables for other projects.

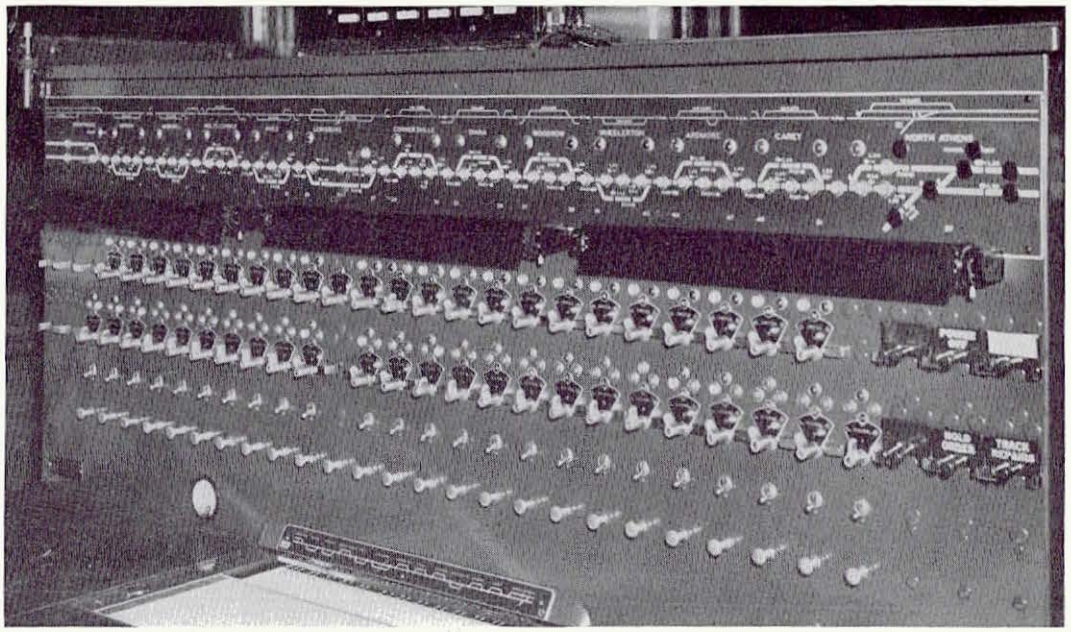
A widely different policy, however, was adopted with reference to centralized traffic control. Soon after we entered the war, unprecedented volumes of traffic were thrown on numerous sections of single-track lines, especially in the Central West and Western states. Even if justified for the future, the materials were not available for additional tracks. Therefore as a means for increasing the track capacity quickly, the War Production Board gave every aid possible in expediting the delivery of materials to complete several extensive C. T. C. projects then under way. Proposals for additional C. T. C. projects were considered strictly on the basis of necessity as a means for expediting war traffic. Some of these installations were completed in 1942, while the manufacturing and field construction for others are being rushed to a degree never before known.

By voluntary action on the part of the railroads as well as on account of encouragement from the War Production Board, every effort is made to conserve critical materials, especially copper wire and steel. New circuits and equipment have been devised to minimize or eliminate line wire circuits for the automatic controls of signals in C. T. C. territories, as for example on the Bessemer & Lake Erie. The C. T. C. line codes between the office and the field stations are superimposed on existing line wires used also for communication, this result being obtained in some instances, as for example on the Southern Pacific and the Seaboard, by the use of carrier current equipment.

The increases in the installations of centralized traffic control during the last three years are evidence of the benefits in train operation effected by such facilities. The

Comparison of Annual Signaling Construction

Type of Installations	Number of Units Installed 1942	1941	1940	1939
AUTOMATIC BLOCK SIGNALS	1,421	1,407	1,017	879
INTERLOCKINGS				
Signals and switches at new plants	785	518	1,024	396
Signals and switches added at rebuilt plants	554	693	734	545
Signals and switches at automatic plants	78	80	125	96
SPRING SWITCHES				
Spring-buffer mechanisms	284	275	294	222
Mechanical facing-point locks	126	159	97	104
Signals at spring switches	384	354	336	228
CENTRALIZED TRAFFIC CONTROL				
Power switch machines	263	190	121	38
Semi-automatic signals	1,030	675	375	122
CLASSIFICATION YARDS				
Car retarders	51	..	11	2
Power switch machines	108	..	19	3
Totals exclusive of crossing protection	5,084	4,351	4,253	2,635
HIGHWAY CROSSING PROTECTIVE UNITS	1,297	2,615	3,006	2,385
Grand Totals	6,381	6,966	7,259	5,020

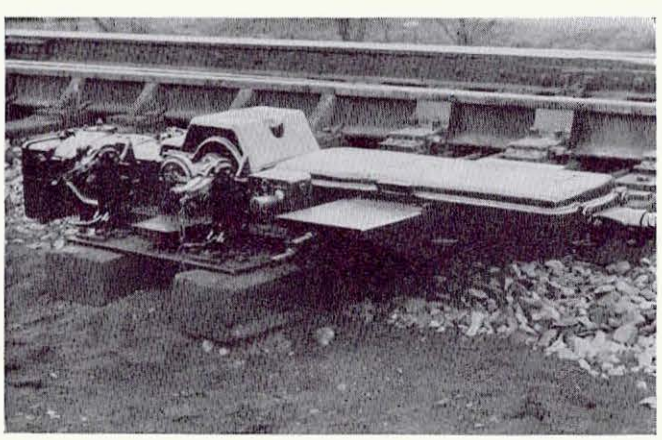


This C.T.C. Machine Controls 22 Power Switches and 70 Signals on 90 Miles Of Single Track

C. T. C. projects in 1940 included 496 power switches and semi-automatic signals on 339 track miles; in 1941 these totals increased to 868 switches and signals on 455 miles; in 1942 they increased still further to 1,294 switches and signals on 807 track miles.

A C. T. C. project completed in 1942 on the Louisville & Nashville between Brentwood, Tenn., and North Athens, Ala., included 22 power switches and 70 semi-automatic signals on 92 miles of single track. One of the C. T. C. projects placed in service during 1942 on the Southern Pacific includes 50 power switches and 217 signals on 80 miles of single track. A project on the Seaboard, between Savannah, Ga. and Thalmann, includes 27 power switches and 93 signals, and in installation on the Virginian between Mullens, W. Va., and Deepwater includes 16 power switches and 66 signals on 58 miles of single track. The Denver & Rio Grande Western installed C. T. C. on 60 miles between Chacra, Colo., and Tunnel, thus completing this system of signaling on 108 miles of single track between Grand Junction, Colo., and Dotsero.

During the early part of 1942, traffic increased rapidly to 60 trains daily on a 37-mile section of single track on the Erie, between Shenango, Pa., and Meadville, on which train movements were authorized by time-table and train orders, with automatic block signal protection.



The C.T.C. Installed In 1942 Included 263 Power Switch Machines

Centralized Traffic Control Installations Completed in 1942

Railroad	Location	Miles of Road	Direct Wire or Coded Control	No. of Levers	No. of Power Switches	No. of Semi-Auto. Signals	Manufacturer
B. & L. E.	Filer, Pa.—Meadville Jct.	32.0s 28.1d	C	35	13	31	Union
B. & G.	Dry Fork, Utah—Vampa	2.0s	DW	3	1	7	G.R.S.
B. & M.	Deerfield Jct., Mass.—East Deerfield	1.0s	DW	5	1*	2	G.R.S.
C. P.	McAdam, N. B.—Vanceboro, Me.	6.0s	DW	2	—	4	G.R.S.
	Walkerville Jct., Ont.—Windsor Yard	3.6s	DW	7	2	7	G.R.S.
C. N.	McKinnon, N. B. (addition)		C	—	4	4	G.R.S.
C. & O.	Walkerford, Va.—Tyre	18.0s	C	7	2	9	Union
	Carntown, Ky.—Stevens	17.0d	WC	15	12	16	Union
C. B. & Q.	Aurora, Ill.—Steward Jct.	40.0s	C	18	9	27	G.R.S.
C. M. St. P. & P.	Indian Creek, Ia.—Covington	7.3s	DW	2	—	4	Union
	Mobridge, S. D.—Moreau Jct.	3.0s	DW	3	—	5	Union
	River Jct., Minn.—LaCrosse, Wis.	2.2s	DW	—	3	11	Union
D. & H.	Binghamton, N. Y.—Sanataria Springs	2.2d	C	6	5	14	G.R.S.
D. & R. G. W.	Chacra, Colo.—Tunnel	60.0s	C	40	20	82	G.R.S.
Erie	Atlantic, Pa.—Stony Point	6.0s	C	13	3	8	Union
I. C.	Otto, Ill.—Ashkum	12.2d	DW	4	—	4	Union
	Ashkum, Ill.—North Gilman	6.3d	DW	4	—	4	Union
	North Gilman, Ill.—Gilman	1.4d	DW	2	—	11	Union
L. & N.	Brentwood, Tenn.—Athens, Ala.	92.0s	C	47	22	70	Union
M. P.	Van Buren, Ark.—Ft. Smith	10.9s	C	14	4	25	G.R.S.
N. Y. C. & St. L.	Westfield, N. Y.—North East, Pa.	15.0s	C	6	2	18	Unnoi
	Kishmans, Ohio—Kimball	21.0s	C	19	7	32	Union
	Hadley, Ind.—So. Whitley	20.0s	C	16	5	23	Union
N. & W.	Pulaski, Va.—Radford	14.2s	C	35	16	54	Union
Penna.	Gem, Ind.—Henry	16.3s	C	30	12	34	Union
	Almeda, Ind.—Limedale	3.1d	C	3	—	—	Union
	Smithboro, Ill.—Vandalia	14.4s	C	1	—	—	Union
P. M.	Elmdale, Mich.—Lake Odessa	10.3s	C	6	1	9	G.R.S.
S. A. L.	Savannah, Ga.—Thalmann	65.0s	C	63	27	93	Union
S. P.	East Switch—West Jct.	80.5s	C	—	50	217	Union
	North End—South Yard	16.6s	C	—	16	60	Union
	Tower 26—Niles	1.9s	DW	4	—	9	Union
T. & P.	Atlanta, Tex.—Marshall	41.4s	C	20	10	50	G.R.S.
	Cut Off Jct., La.—Cedar Grove	3.2s	DW	2	—	5	G.R.S.
U. P.	Daggett, Calif.—Yermo	4.6s	C	12	1	15	Union
Virginian	Mullens, W. Va.—Deepwater	58.0s	C	36	16	66	G.R.S.
	Totals	666.4s 70.3d	23C 12DW 1WC	480	263 1*	1030	
	Road Miles	736.7			264		
	Track Miles	807.0					

Legend:
In "Miles of Road" column: s = Single track, d = Double track.
C = Coded Control.
DW = Direct-Wire Control.
WC = Both Coded and Direct-Wire Control.
* = Electric Switch Lock.

Two or more tracks are provided on practically all other portions of the Erie between New York and Chicago, and, therefore, something had to be done quickly to increase track capacity and to reduce delays on this section

Spring Switch Including a Mechanical Facing-Point Lock

of single track. On account of local conditions, as well as the possible delays in securing materials for centralized traffic control, a decision was made to install an arrangement of traffic-direction locking, by means of which train movements between block offices are authorized by signal indication, thus eliminating train orders. The con-

Gates Were Installed at About 104 Crossings During 1942

Interlockings Constructed in 1942 Including Also Remotely Controlled Plants

Railroad	Location	Number of Signal Operative Units	Number of switches and derails Operated by: Electric Machine	Electro-Pneumatic	Mechanical Connections	Manufacturer
Manual control using levers with mechanical locking						
New						
A. C. L.	No. Petersburg, Va.	8	2	—	—	Union
B. & M.	Sommerville, Mass.	1	—	—	—	Union
C. N.	Cutamount, N. B.	3	1	—	—	.....
C. & O.	Oriana, Va.	16	11	—	—	Union
	Beaver Jct., Ky.	6	—	—	4	Union
C. R. I. & P. (*SA)	Wheatley, Ark.	4	—	—	1	Union
D. M. & I. R. Ø.	Virginia, Minn.	1	—	—	—	G.R.S.
M. P.	E. Krotz Springs, La.	2	—	—	2	Union
N. Y. C.	Browns, Pa.	7	3	—	—	G.R.S.
Penna.	Back River, Md.	8	—	4	—	Union
	Stubblefield, Ill.	3	1	—	—	Union
	Highland, Ill.	7	2	—	—	Union
	St. Jacob, Ill.	8	3	—	—	Union
Southern	Morgan, S. C.	2	—	—	2	G.R.S.
T. & P.	West Bridge Jct., La.	23	20	—	—	G.R.S.
	Waskom, Tex.	5	—	—	—	G.R.S.
Totals		104	43	4	9	
Rebuilt						
A. T. & S. F.	San Bernardino, Calif.	6	4	—	—	G.R.S.
A. C. L.	Pinners Point, Va.	11	—	—	10	Union
	Offerman, Ga.	8	—	—	6	Union
B. & M.	Aver, Mass.	—	—	1	—	Union
	Winter Hill, Mass.	1	—	—	—	G.R.S.
G. T. W.	Lansing, Mich.	27	6	—	52	G.R.S.
	Greenville, Mich.	6	—	—	8	Union
	Detroit, Mich.	10	—	—	—	Union
	Detroit, Mich.	14	—	—	—	Union
C. N.	Pacific Jct., N. B.	6	3	—	—	.....
C. & O.	Doswell, Va.	2	2	—	—	Union
	Lynchburg, Va.	3	—	5	—	Union
	Quinnimont, W. Va.	3	—	—	—	Union
	Russell, Ky.	1	1	—	—	Union
C. & W. I.	Chicago, Ill.	18	—	—	10	Union
C. M. St. P. & P.	A-4, Chicago, Ill.	—	2	—	—	G.R.S.
C. N. S. & M.	Rawson, Wis.	13	2	—	20	G.R.S.
L. S. & I.	Marquette, Mich.	4	—	—	—	G.R.S.
Me. C.—P. T.	Portland, Me.	6	—	—	4	.....
N. & W.	Coaldale, W. Va.	2	—	—	—	Union
	Glen Jean, Ohio	3	—	—	—	Union
Penna.	W. Fairview, Pa.	40	4	10	15	Union
	Ruckville, Pa.	42	2	23	—	Union
	Piqua, Ohio	15	10	—	—	G.R.S.
	Dunkirk, Ohio	14	—	—	10	Union
	Van, Ind.	6	2	—	—	Union
T. & P.	Bells, Tex.	4	—	—	—	Union
	Texarkana, Tex.	32	—	13	—	Union
Union R. R.	Turtle Creek, Pa.	4	—	4	—	Union
Wabash	So. Adrian, Mich.	8	—	—	2	.....
	Jacksonville, Ill.	10	—	—	4	.....
Totals		319	38	56	141	
Manual control using miniature levers or push buttons with no mechanical locking but with circuit interlocking.						
A. T. & S. F.	Atherton, Mo.	3	1	—	—	Union
	Belen, N. M.	26	8	—	—	Union
B. & M.	Winchester, Mass. (A)	—	1	—	—	Union
	Deerfield Jct., Mass. (A)	3	—	—	—	G.R.S.
	Nashua, N. H.	8	6	—	—	G.R.S.
C. N.	Prescott, Ont.	4	1	—	—	G.R.S.
	Moncton, N. B.	10	9	—	—	.....
G. T. W.	Schoolcraft, Mich.	10	—	—	3	Union
C. & W. I.	Chicago, Ill.	8	4	—	—	Union
C. M. St. P. & P.	Pacific Jct., Ill.	27	31	—	—	Union
	Canton, S. D.	9	3	—	—	Union
	Bridge Switch, Minn. (A)	1	1	—	—	Union
D. L. & W.	Analomink, Pa. / W. Henryville, Pa.	7	1	—	—	Union
	Pocono Summit, Pa.	6	—	—	—	Union
	Dalton, Pa. / Factoryville, Pa.	5	1	—	—	Union
Erie	Corry, Pa.	9	—	—	—	Union
	Cleveland, Ohio	9	10	—	—	Union
G. N.	Coon Creek, Minn.	8	3	—	—	G.R.S.
I. C.	Leverett, Ill.	5	3	—	—	Union
	Glen Carbon, Ill.	3	1	—	—	G.R.S.
	Peosta, Iowa	3	1	—	—	G.R.S.
L. & N.	Birmingham, Ala.	9	2	—	—	G.R.S.
	Lewisburg, Tenn.	2*	—	—	—	Union
M. St. P. & S. Ste. M.	Argonne, Wis.	5	1	—	—	G.R.S.
	Duluth, Minn.	7	1	—	—	G.R.S.
M. P.	Gypsum, Kan.	4	1	—	—	G.R.S.
N. Y. C.	Woodlawn, N. Y.	27	17	—	—	G.R.S.
C. C. C. & St. L.	Dix, Ind.	6	1	—	—	G.R.S.
	Rex, Ind.	8	—	—	—	G.R.S.
	Altamont, Ind.	4	1	—	—	G.R.S.
N. Y. C. & St. L.	Dean, Pa.	4	1	—	—	Union
N. & W.	Coaldale, W. Va.	8	—	4	—	Union
	Glen Jean, Ohio	6	—	1	—	Union
	Renick, Ohio	13	—	1	—	Union
N. P.	Ainsworth Jct., Wash.	—	1	—	—	G.R.S.
Penna.	Petersburg, Pa.	9	—	6	—	Union
	Wilmington, Del.	62	9	34	—	Union
	Hudson, Ohio	34	—	11	—	Union
	St. Elmo, Ill.	3	1	—	—	Union
	East Marion, Ind.	8	2	—	—	Union
	Aden, Ill.	7	2	—	—	Union
	Casey, Ill.	3	1	—	—	Union
P. & P. U.	Pekin, Ill.	13	9	—	—	G.R.S.
	Pekin Jct., Ill.	3	1	—	—	G.R.S.
P. M.	Flint, Mich.	4	—	—	—	G.R.S.
River Term.	Cleveland, Ohio	1	1	—	1	G.R.S.
S. P.	Tehama, Calif.	11	2	—	—	Union
	Frazier, Ore.	7	1	—	—	Union
	Vincent, Calif.	14	2	—	—	Union
Southern	Harriman, Tenn.	13	2	—	—	G.R.S.
T. & P.	Jefferson, Tex.	4	—	—	—	G.R.S.
Totals		461	144	57	4	
		2*				
		463				
Grand Totals		884	225	117	154	
		2*				
		886	225	117	154	

Legend:
A = Additions.
* = Gates with electric locks.
Ø = Gates locked electrically and controlled remotely.
SA = Semi-automatic.

Highway-Railroad Grade Crossing Protection Installed During 1942

Railroad	No. of Crossings	Source of Funds: Railroad	Source of Funds: Public Funds of Any Source	Source of Funds: Joint Railroad and Public Funds	Total No. of Protective Units	No. of Wig-Wag Signals	No. of Flashing Light Signals	No. of Rotating Disk Stop Sign Signals with Flashing Lights	No. of Traffic Type Stop and Go Crossing Signals	No. of Electrically Operated Gates
Alton	2	1	1	..	4	..	4	..	..	..
A. T. & S. F.	15	9	6	..	32	10	22	..	..	..
A. & St. A. B.	1	..	1	..	4	..	2	..	..	2*
A. C. L.	31	1	30	..	80	..	36	30	..	14
B. & O.	14	4	8	2	51	..	37	..	..	14
B. & M.	13	5	7	1	34	..	25 6(b) 1#	..	..	2
C. N.	35	14	15	6	84	..	68	..	..	16
C. P.	11	4	3	4	26	..	25 1(b)P	..	..	..
C. of G.	1	..	1	..	3	..	3	..	..	..
C. & O.	4	3	1	..	11	..	11	..	..	..
C. & E. I.	2	1	1	..	4	..	4	..	..	..
C. & N. W.	24	9	14	1	70	9	20	26	..	15
C. & W. I.	4	4	..	..	8	..	8	..	..	..
C. A. & E.	1	..	..	1	4	..	..	..	..	4
C. G. W.	9	..	9	..	18	..	6	4	..	8
C. I. & L.	14	14	..	..	18	..	5	..	9	4
C. M. St. P. & P.	11	2	9	..	24	1	7	..	..	16
C. N. S. & M.	5	1	4	..	10	..	5	..	..	5
C. R. I. & P.	17	7	9	1	38	..	20	2	..	16
C. St. P. M. & O.	1	..	1	..	3	..	..	3	..	..
C. & S.	2	..	2	..	5	..	5	..	..	..
D. & H.	9	9	..	..	18	..	18	..	..	..
D. L. & W.	5	5	..	..	18	..	16	..	..	2
D. M. & I. R.	1	1	..	..	2	..	..	2	..	..
Erie	5	5	..	..	14	..	5	..	1	8
G. N.	7	4	3	..	16	..	2	12	..	2
G. M. & O.	1	..	1	..	3	..	3	..	..	..
I. C.	16	7	6	3	49	..	35	..	..	14
L. & H. R.	2	2	..	..	4	..	4	..	..	..
L. & N. E.	1	..	..	1	2	..	2	..	..	..
L. V.	2	2	..	..	8	..	4	..	..	4#
L. I.	5	5	..	..	12	..	12	..	..	..
L. & A.	1	1	..	..	2	..	2	..	..	..
L. & N.	7	3	4	..	25	..	15	..	..	10
M. C.	5	2	2	1†	8	..	8	..	..	..
M. & St. L.	4	2	2	..	8	..	2	6	..	..
M. St. P. & S. Ste. Marie	7	1	6	..	17	..	7	10	..	..
M-K-T	5	2	3	..	10	..	10	..	..	..
M. P.	27	13	13	1	70	..	60	..	..	10
N. C. & St. L.	2	..	2	..	4	..	4	..	..	..
N. Y. C.	23	8	15	..	57	..	47	..	..	10
N. Y. C. & St. L.	3	..	3	..	8	..	8	..	..	..
N. Y. N. H. & H.	1	1	..	..	2	..	2	..	..	..
N. & W.	10	9	1	..	24	17	5	..	..	2
N. P.	5	..	5	..	10	..	..	10	..	..
Penna.	23	18	3	2	71	..	51	..	..	20
P. & P. U.	1	1	..	..	1	..	1	..	..	..
P. M.	17	3	11	3	34	..	34	..	..	..
Reading	2	1(J)	..	1	4	..	4	..	..	..
St. L.-S. F.	16	7	9	..	34	..	22 4(R)	..	..	2 6#
St. L. S.	11	4	7	..	24	..	22	..	..	2
S. A. L.	13	..	13	..	32	..	32	..	..	..
S. P.	24	10	11	2 1†	47	6	41	..	..	..
Southern	13	10	3	..	34	..	34	..	..	..
S. I.	1	..	1(J)	..	1	..	..	1	..	..
T. Assn. of St. L.	1	1	..	..	2	..	2	..	..	..
T. & N. O.	8	6	2	..	16	4	10	..	..	2
T. & P.	3	1	2	..	8	..	8	..	..	..
U. P.	21	7	14	..	33	2	31	..	..	..
Wabash	10	..	8	2	24	..	22	2	..	..
W. M.	1	1	..	..	1	..	1(b)	..	..	..
W. P.	4	1	3	..	7	..	7	..	..	..
W. & L. E.	1	1	..	..	2	..	2	..	..	..
Totals	541	232 1(J)	274 1(J)	31 2†	1297	49	908 7(b) 1(b)P 4(R)	108	10	198 10# 2*
	541	233	275	33	1297	49	920	108	10	210

Legend:
†=Installation paid for by industries or individuals.
P=Pedestrian.
*=Evans Auto-Stops.
#=Units added to existing installations.
b=Bell.
J=Installation paid for jointly with other railroads.
R=Replaced other forms of protection.

trols of the automatic signaling previously in service were in part converted to operate on the absolute permissive block system, and a two-wire, buck-battery traffic-direction circuit was installed to control traffic-direction indicators and electric locks on levers which control the signals for overall blocks between interlockings. Therefore, insofar as authorizing train movements without train orders is concerned, the benefits are the same as if centralized traffic control had been installed.

During 1942 automatic block signaling was installed on 1,050 miles of road including 1,412 miles of track, a total of 1,421 signals being involved. On territories to be equipped with C. T. C., if automatic signaling was not previously in service, such signaling was installed as a part of the project. Such was the case on the 92 miles of the Louisville & Nashville between Brentwood, Tenn., and North Athens, Ala., as well as on the 59 miles of single track on the Virginian between Mullens, W. Va.,

and Deepwater. On some C. T. C. projects, such as on the Southern Pacific, semaphore automatic block signals were replaced with new color-light signals. On other C. T. C. projects, such as on 65 miles on the Seaboard, and 41 miles on the Texas & Pacific, color-light automatic-block signals were already in service, although some were relocated to provide longer braking distances.

Automatic Block Signals Completed During 1942

Railroad	Location	Miles of Road	Number of Signals	Manufacturer
A. T. & S. F.	Richmond, Calif.—Malott	4.0s	5s	Union
B. & M.	Deerfield Jct., Mass.—East Deerfield	1.0s	1c	G. R. S.
	Deerfield, Mass., Deerfield Jct.	1.5d	1c	G. R. S.
	Nashua, N. H.	2.2d	3c	G. R. S.
	Mystic Jct., Mass.—Wedgemere	5.3d	12c	G. R. S.
	Walnut Hill, Mass.—So. Wilmington	2.6d	4c	G. R. S.
	Silver Lake, Mass.	0.6d	1c	G. R. S.
	Wedgemere, Mass., station signal		2c	Union
	Walnut Hill, Mass., station signal		1c	Union
	Wilmington, Mass., station signal		1c	Union
	Silver Lake, Mass., station signal		1c	Union
B. & L. E.	Filer, Pa.—Meadville Jct.	32.0s 28.1d	21c	Union
C. P.	Greenville, Me.—Squaw Brook	7.9s	8c	G. R. S.
C. N.	Eastern Jct., Que.—Val Royal	1.0s	1c	G. R. S.
	Richmond, Que.—Gore	3.0s	2c	G. R. S.
	West Toronto, Ont.—Weston	3.0s	4c	G. R. S.
C. & O.	Westham, Va.—Strathmore	59.0s 2.0d	87c	Union
	Frederick Hall, Va.—Gordonsville	25.0s	37c	Union
	Lindsay, Va.—Strathmore	29.0s	26c	Union
	Cabin Creek Jct., W. Va.—Spring Hill	14.0d	23c	Union
	Concord, Ky.—Sand Hill	10.0d	11c	Union
C. & E. I.	Danville, Ill., station	0.5t	8c	Union
	Terre Haute, Ind., station	0.5s	2c	Union
C. & W. I.	Chicago, Ill.	2.0d	1s	Union
			1c	Union
C. A. & E.	Wheaton, Ill.—Elgin	3.1s	6c	Union
C. G. W.	Elmhurst, Ill.—Richardson	35.0s	50c	Union
C. R. I. & P.	Widener, Ark.—Brinkley	29.3s	35c	Union
	Mercer, Mo.—M. P. 397	14.0s	14c	Union
D. L. & W.	Syracuse, N. Y.	0.8s	3s	Union
D. & R. G. W.	Kelker, Colo.	1.7d	2c	G. R. S.
	Salida, Colo.	0.8s	2c	G. R. S.
E. J. & E.	Dyer, Ill.	1.0d	1c	G. R. S.
	Ivanhoe, Ind.	1.0d	1s	G. R. S.
	Normantown, Ill.	1.2s	1s	G. R. S.
Erie	Hammond, Ind.—HY	2.0d	1c	Union
G. N.	Coon Creek, Minn.—Brook Park	55.0s	70c	G. R. S.
	So. Bellingham, Wash.—Blaine	25.0s	31c 7s	G. R. S.
	Endot, B. C.—Vancouver Jct.	2.0s 7.0d	17c	G. R. S.
I. C.	Peosta, Ia.—Masonville	38.4s	53c	Union
	Bemis, Tenn.—Perry	0.9s	2c	Union
L. & N.	Brentwood, Tenn.—N. Athens, Ala.	92.0s	52c	Union
	Decatur, Ala.—Black Creek	91.0d	60c	G. R. S.
	Higgins, La.—Gentilly	7.4d	8s	G. R. S.
	Flomaton, Ala.—Miles, Ala.	2.0d	5s	G. R. S.
L. V.	Mortimer, N. Y.—Rochester Jct.	9.2s	11c	G. R. S.
Me. C. and P. T. W.	Falmouth, Me.—Freeport	14.0d	21c 7c	G. R. S. G. R. S.
M. P.	Van Buren, Ark.	2.3s	3c	G. R. S.
	Ft. Smith, Ark.—Chaffee	12.9s	28c	G. R. S.
	Greenwood Jct., Okla.—Wagoner	80.5s	120c	G. R. S.
	Crossover, Tex.		4c	G. R. S.
N. Y. C.	Wayneport, N. Y.—Rochester	9.0f	37c	G. R. S.
	Syracuse Jct., N. Y.—Jordan	10.0f	37c	G. R. S.
C. C. C. & St. L.	Columbus, Ohio	0.9d	2c	Union
	Shelbyville, Ohio—Dix, Ind.	11.9s	12c	Union
	Dix, Ind.—Beech Grove	8.1d	6c	Union
	Clarks Hill, Ind.—Altamont	12.0s	14c	G. R. S.
	Harrisburg, Ill.—Saline Valley	5.1s	4s	Hall
Penna.	Rahway, N. J.—Newark	7.4d	15c	Union
	Irvineton, Pa.—Warren, Pa.	6.3d	4c	Union
P. M.	Walkerville Jct., Ont.—Pelton	3.0s	3c	G. R. S.
P. & L. E.	Monaca, Pa.—Wampum	16.3f	38c	Union
	Wampum, Pa.—New Castle	7.0d	10c	Union
Reading	Park Jct., Pa.—West Falls	3.8d	3c	G. R. S.
	Birdsboro, Pa.—Reading	8.6d	9c	G. R. S.
	Cheltenham, Pa.—Bryn Athyn	5.4s	14c	G. R. S.
St. L.-S. F.	Bundy Jct., Mo.—Ft. Wood	19.5s	36s	Union
Southern	Clinton, Tenn.—Harriman	29.0s	44c	G. R. S.
T. H. & B.	Welland, Ont.—Hamilton	26.3s 14.1d	82c	G. R. S.
Union R. R.	Wilson, Pa.—Curry Hollow	2.5d	4c	Union
	Mifflin, Pa.—Clairton Jct.	4.0d	6c	Union
	E. Pittsburgh, Pa.—Turtle Creek	1.0d	4c	Union
Virginian	Mullens, W. Va.—Deepwater	58.0s	136c	G. R. S.
Wabash	Salisbury, Mo.—Brunswick	18.1d	16c	Union
	Markham, Ill.—Bluffs	12.1s	16c	Union
Totals		750.1s 264.2d .5t 35.3f	71s 1410c	
Grand Totals		1050.1	1481	

Legend:
In "Miles of Road" column: s = single track, d = double track, t = three tracks, f = four tracks.
In "Number of Signals" column: s = semaphore, c = color-light.

The most extensive installation of new automatic block signaling on other than C. T. C. territories that was made in 1942 was on 91 miles of double track on the Louisville & Nashville between Athens, Ala., and Black Creek. This project utilizes modern coded track circuit controls which eliminate line control wires. Also the searchlight signals, signal lamps, control relays and half of the code transmitters are normally de-energized, so that the system is operated by local primary battery, eliminating an a-c. power distribution circuit which ordinarily would be required for charging batteries.

On 80 miles of single track between Van Buren, Ark., and Wagoner, Okla., the Missouri Pacific installed automatic block. The Great Northern installed automatic block on 55 miles of single track between Coon Creek, Minn., and Brook Park, thus completing the signaling on the 160-mile line between St. Paul, Minn., and Duluth. On an installation of automatic block signaling on 12 miles of single track between Markham, Ill., and Bluffs, the Wabash used galvanized iron line wires for the signal control circuits as a means for conserving copper. Also, one reason for using primary batteries was to obviate the need for an a-c. power distribution line wire circuit.

On 26 miles of single track and 14 miles of double track, the Toronto, Hamilton & Buffalo replaced semaphores with color-light signals. On various sections of multiple-track line, totaling about 69 track miles, the Pittsburgh & Lake Erie replaced semaphore automatic signals with light signals, the project including the most modern arrangements of coded track circuits, thus obviating the use of line wires for signal control circuits. On certain sections of the New York, New Haven & Hartford, semaphores were replaced with light signals, the project including coded track circuits.

Automatic Interlockings Installed in 1942

Railroad	Location	Number of Signals	Manufacturer
B. & O.	Lima, Ohio	6	.....
B. & G.	Garfield, Utah	4	G. R. S.
	Dry Fork, Utah	1	G. R. S.
		1*	
C. P.	Essa South, Ont.	9	G. R. S.
D. & R. G. W.	Lakota, Utah	8	G. R. S.
		1*	
L. & N. E.	Augusta, N. J.	9	G. R. S.
M. St. P. & S. Ste. M.	Rice Lake, Wis.	6	G. R. S.
M. & St. L.	Ackley, Ia.	4	.....
Penna.	Bunker Hill, Ill.	4	Union
R. & S.	Ha Ha Bay Jct., Que.	4	G. R. S.
T. & N. O.	Lake Charles, La.	7	Union
T. H. & B.	Victoria Ave., Hamilton, Ont.	10	G. R. S.
	Gage Ave., Hamilton, Ont.	4	G. R. S.
Totals		76 2*	
		78	

Legend:
Electric Switch Machines.

Counting the number of operative signal units and switches, interlocking facilities installed during 1942 in new plants or as additions to existing plants, totaled 1,417 units, an increase as compared with the 1,291 units placed in service in 1941. During the year just closed, 57 completely new interlockings were installed, as compared with 43 in 1941. Of the 57 new plants, 42 were of the more modern types, involving no mechanical locking between levers or electric lever locks, the interlocking being accomplished by interconnections of circuits, and the control machines including either miniature levers or buttons. A new miniature lever electric interlocking installed on the Chicago, Milwaukee, St. Paul & Pacific at Pacific Junction, Ill., includes 31 operative signal units and 30 electric switch machines. An electric interlocking installed by the New York Central at

Woodlawn, N. Y., includes 27 signals and 17 switch machines.

A total of 284 switches were equipped with oil-buffer spring mechanisms during 1942, as compared with 275 in 1941. Of the spring switches installed, 210 were at the ends of passing tracks, 36 at the ends of double track, 19 at junctions and 19 at yard switches. Automatic mechanical facing-point locks were included in 120 of the new spring switch installations, and such locks were added at 6 existing spring switches. A total of 384 signals were installed at spring switches.

In 1942, automatically-controlled highway-railroad crossing protection was installed at 530 crossings, including 1,272 protective units, a decrease compared with 1,220 crossings and 2,615 units in the year previous. A unit includes a flashing-light signal with back-to-back mounting, a wig-wag, a disk signal with flashers, a traffic-type signal, a gate, or a barrier. In 1942 a total of 905 flashing-light signals were installed, as compared with 1,871 in 1941, and only 49 wig-wags were installed, as compared with 144. The number of automatically-controlled crossing gates installed in 1942 totaled 199, a reduction as compared with 425 in the year previous. On the majority of these projects, short-arm, one-lane gates were used in connection with flashing-light signals. Stop-and-go, traffic type signals were installed at five crossings, totaling 10 signals. A total of 108 rotating-disk signals with flashing-light units were installed in 1942, as compared with 182 in the year previous. Two barriers, of the type which rise up out of the surface of pavements, were installed at one crossing. Of the total of 534 crossings at which protection was installed, 233 projects were paid for by public funds, 275 were paid for by the railroads, and 33 were paid jointly by public funds and the railroads.

Whereas no freight classification yards were equipped with power switch machines and car retarders during 1941, three such projects were placed in service during 1942. The Norfolk & Western completed a yard at Roanoke, Va., that included 52 power switches and 28 retarders. This project includes a two-way telephone yard communication system by means of which conversation can be carried on between the humpmaster and the engineman of any of the yard locomotives. At Portsmouth, O., the Norfolk & Western installed 20 power switch machines and 6 retarders in a new yard used exclusively for time-freight traffic. At Galesburg, Ill., the Chicago, Burlington & Quincy equipped a yard with 35 power switch machines and 17 retarders. This project is to include a telephone yard communication system as soon as the materials can be secured.

During 1942, the Pennsylvania installed the Union Switch & Signal Company's communication equipment in three yards. The project at Frenchtown, N. J., includes two-way telephone communication, with one locomotive, one office and one caboose equipped. The installation in Hawthorne yard, Indianapolis, Ind., provides one-way communication between a hump office and two locomotives, while at Columbus, Ohio, one locomotive was equipped. Nine yard communication projects are now under construction or planned for 1943, to include equipment for 11 offices, 49 locomotives and 9 cabooses.

During 1942, the Louisville & Nashville installed automatic train control on 7.4 miles of double track between Higgins, La. and Gentilly. The remainder of the year's activity in the train control and cab signaling field consisted of the installation of equipment on new locomotives, a total of 210 such units being placed in service during 1942, as compared with 289 in 1941, and 103 in 1940.

Spring Switches Installed During 1942

Railroad	Total No. of Spring Switches Installed	Classification as to Application: End of Passing Track	End of Double Track	Junction	Yard Track	Total No. Equipped with Facing Point Lock	Signal Protection: High Signals	Low Signals
A. T. & S. F.	11	9	1	1	..	9	16	5
B. & O.	2	..	2	..	..	..	2	..
C. N.	7	6	..	..	1	..	6	8
C. P.	3	2	..	..	1	2	4	3
C. & O.	8	6	1	..	1	7	1	4
C. & E. I.	1	1	..	..	..	1	2	1
C. & I. M.	2	2	..	..	..	..	..	2
C. & N. W.	3	1	1	1	..	..	3	2
C. B. & Q.	1	1	..	..	..	1	2	..
C. R. I. & P.	3	2	..	1	..	2	3	..
D. L. & W.	3	..	3	..	..	..	6	3
E. J. & E.	3	3	..	..	..	..	2	1
G. N.	15	11	1	2(W)	1	15	24	..
I. C.	15	9	..	2 1(X)	3	..	9	6
L. & N.	23	21	..	1	1	..	37	10
M. St. P. & S. Ste. M.	5	3	..	2	..	4	11	3
M. P.	8	4	1	1 1(W)	1	2(F) 6	13	5
N. Y. C. & St. L.	2	1	1	..	..	2	2	1
N. & W.	1	1(X)	..	..	..	..	..	2
Penna.	2	1	1	..	..	2	1	..
P. M.	15	11	4	..	..	15	25	2
R. F. & P.	2	..	..	..	2	..	..	..
St. L.-S. F.	2	..	1	..	1	1	4	1
	4	..	4	..	..	4(F)	8	4
St. L. S.	1	..	..	..	1	1	1	..
S. P.	49	46	1	1	1	48	96	6
T. & N. O.	8	2	4	..	2	..	..	..
Southern	68	60	4 1(X)	3	..	..	4	6
T. & P.	4	..	1	1	2	..	3	7
T. H. & B.	1	..	1(D)	..	..	..	..	..
U. P.	9	7	1	..	1	1	3	9
W. M.	3	..	2	1	..	3	5	..
Totals	284	209 1(X)	34 1(X) 1(D)	15 3(W) 1(X)	19	120 6(F)	293	91
	284	210	36	19	19	126	293	91

Legend:
(W)=Wye track.
(X)=Crossover.
(F)=Facing point lock assemblies added to spring switches installed previously.
(D)=Derail on grade.

Car Retarder Projects Placed In Service During 1942

Railroad	Yard	Number of Tracks	Number of Retarders	Rail Ft. Retarders	Number of Switches	Number of Track Circuits	Signals
N. & W.	Portsmouth, O.	18	6	399	20	20	8
N. & W.	Roanoke, Va.	46	28	1897	52	52	11
C. B. & Q.	Galesburg, Ill.	35	17	1273	38	38	3
Totals		99	51	3569	110	110	22

Locomotive Train Control and Cab Signal Equipment Installed in 1942

Railroad	Number of Locomotive Equipments	Manufacturer
B. & O.	8	G.R.S.
G. M. & O.	2	G.R.S.
I. C.	15	Union
N. Y. C.	25	G.R.S.
N. Y. N. H. & H.	15	G.R.S.
N. Y. C. & St. L.	10	Union
N. & W.	12	Union
Penna.	103	Union
R. F. & P.	15	Union
Southern	5	G.R.S.
Total	210	

Tire Shortage and Gasoline Rationing Have Added to Bus Operating Problems

The Railway Motor Transport Year

Little new co-ordinated service installed as rubber shortage makes itself felt

By Charles Layng
Transportation Editor

FOR the first time in many years, there is almost no expansion to report in rail-highway co-ordinated service. The rubber shortage, restrictions on the manufacture of trucks and buses and priorities governing their sale all had their effect in curtailing this important feature of railway service, which, until 1942, has shown a continuously rapid growth since it was first inaugurated in the middle 1920's. There is no immediate prospect of any change in this condition, so far as this service is concerned; on the contrary, there is every prospect that contraction rather than expansion of rail-highway transport, along with other forms of highway transport, may be expected as present trucks, buses and tires wear out.

During the war year of 1942 and continuing for the duration, the emphasis on carload traffic, that is to say, the mass rail transportation so vital to the war effort, will have the further effect of dimming the importance of handling less than carload traffic, the volume of which is being diminished still further by the cessation of the manufacture of a large number of items of consumer goods for civilian consumption, which formerly made up a large percentage of merchandise shipments. After the war, this condition is likely to continue for some years, as rubber will certainly not be immediately available when peace treaties are signed, unless the synthetic rubber plants have developed to a point where they can supply substitutes in a volume sufficient to take care of the vast civilian needs.

Truck Operation

The efficiency and flexibility of rail-highway co-ordinated freight service was amply demonstrated during the year in complying with Office of Defense Transportation Order No. 1. Those railways which were operating such service on a large scale had no difficulty in complying with the prescribed minimum load limits for merchandise cars. Under the co-ordinated system, small quantities of merchandise for local stations are distributed by truck and cars are loaded from and to concentration and distribution points only. Since such cars contained freight consolidated at one station after being picked up at various shipping points by truck, or freight destined to one station in a freight car, for distribution by truck to local destinations, they were, in almost every case, handled with sufficient tonnage to comply with the O. D. T. order before that order was issued. Railways that were not operating a widespread trucking service have been compelled, in many instances, to cancel former regular package car routes or to delay merchandise by holding package cars over from one to three or four days, awaiting sufficient loading so that the prescribed minimum might be obtained.

Trucks in Co-Ordinated Service Aided in Handling Merchandise Traffic

Of course, the railway trucks themselves, along with other highway freight transport, are subject to minimum load restrictions by the O. D. T. A number of routes were so set up that, while they had a large one-way load factor, either the going or the return trip was very light. In the interest of efficient operation, such conditions as could be corrected were taken care of before the O. D. T. order was issued. Nonetheless, there were many routes in the country where a matching up of a satisfactory load factor in both directions was impossible and for this reason a considerable re-arrangement of routes has taken place.

In general, it may be said that routes where relatively lightly loaded trucks were operated principally for competitive reasons have been abandoned and the trucks diverted to other routes where the load factor in both directions is greater and the contribution to the war transportation effort is more effective. Unfortunately, other services have also been affected adversely, where, by reason of the character of the territory served, the tonnage was overwhelmingly in one direction, and no freight was available in the opposite direction. An example of this is in oil-field territory adjacent to a railway branch line, where the inbound movement of tools and supplies is heavy, but the outbound movement available for trucking is nil, since only oil is produced and this moves by pipe line or tank car. In such cases, transportation suffers by reason of the order.

Wherever possible, however, the transportation situation has been studied to get the maximum tonnage hauled by the trucks. In certain purely agricultural areas of the south and southwest, for example, trucks move into the towns from urban centers, carrying materials and supplies and pick up sufficient cotton on the return trip to comply with the load limit. Similar arrangements on other commodities have been made in other territories to keep the trucks moving.

The use of trucks instead of freight cars in terminal areas to exchange less-than-carload freight between stations in the same city has been encouraged by the O. D. T. as a method for saving cars. The use of trucks by the railways in the handling of company materials has remained static through the year, because of the difficulties in securing automotive materials. This applies also to the practice of equipping water service and other crews with trucks, which practice was being extended rapidly. Under conditions of present heavy traffic, the efficiency of taking such gangs off the rails and putting them on the highways is even more apparent, but until the necessary trucks and tires can be obtained nothing further can be done in this direction.

During the year, the O. D. T. considered a tentative plan for an arbitrary division of freight between highway and rail transport on the basis of distance, the trucks, of course, to get the short-haul traffic and the railways the long-haul traffic. This aroused a storm of protest from the trucking industry, which, war or no war, has been insistent upon its rights to handle long-haul traffic. It might be mentioned, in this connection, that one of the first applications for new tires approved by a rationing board was for a truck operating between Brownsville, Texas, and Denver, Colo.

The Bus Situation

As it happened, several of the railways operating bus subsidiaries had just placed orders for new buses before the freezing order went into effect. Presumably with the idea of conserving the new equipment, however, the O. D. T. promptly placed a maximum of 4,000 miles per month on it, in a territory where other buses average 12,000 miles a month and more. In more than one case in California, where the increase in bus travel has been unusually large because of the increase in population brought about by the establishment of large war industries, this ruling has resulted in the necessity for turning away large numbers of passengers, while the new buses were standing around idle because they had reached their monthly maximum mileage.

Whatever the merits of the 35 m. p. h. speed limit rule for intercity buses may be from a rubber conservation standpoint, there is no doubt but that it has materially restricted the passenger-carrying capacity of the nation's buses and placed an added strain on railway passenger transportation. No expansion can be expected in the bus business for the duration. On the contrary, a gradual and continuing loss in efficiency and passenger-carrying capacity is inevitable. Whatever additional in-

tercity travel may be diverted to public carriers because of nation-wide gas rationing will have to be absorbed by the railways as the bus industry has reached the saturation point and cannot expand under present operating conditions.

The abolition of sight-seeing buses has materially affected many of the railway bus subsidiaries. To a certain extent throughout the country, but particularly in the West, the operation of buses to scenic spots in connection with rail transportation had reached the status of a large industry. This sort of operation, however, is "out" for the duration.

During the year, the O. D. T. has made earnest efforts to eliminate duplicate schedules, particularly in local territory, as between trains and buses. That these efforts have been largely ineffectual must be attributed to the state commissions, which, in general, have consistently refused to co-operate in the promotion of such efforts.

The accompanying list of orders for highway vehicles shows that during 1942 railroads and their reporting subsidiaries and affiliates placed orders for a total of 580 motor buses, 2,424 units of highway freight equipment (1,850 trucks, 303 tractors and 271 trailers), 268 automobiles and one miscellaneous vehicle. This compares with 641 motor buses, 4,106 units of highway freight equipment, 385 automobiles, two miscellaneous vehicles and four combination vehicles for both passenger and freight service ordered during 1941. Canadian roads and their affiliates placed orders for 26 motor buses, one truck and two automobiles during 1942.

Orders for Highway Vehicles

Purchaser	No.	Type of Vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Atchison, Topeka & Santa Fe					
Santa Fe Trail Transportation Co.	43	Bus	37	Rev.	a.c.f. Motors
	10	Bus	38	Rev.	Int. Harvester
	4	Bus	29	Rev.	Diamond T
	3	Bus	36	Rev.	Fitzjohn
	2	Bus	16	Rev.	Ford
	1	Bus	42	Rev.	Ford
	1	Bus	39	Rev.	Reo
	4	Tractor	2 ton	Rev.	General Motors
	1	Tractor	1½ ton	Rev.	General Motors
	16	Trailer	3 ton	Rev.	Fruehauf
	4	Trailer	3 ton	Rev.	Dart
	2	Trailer	3 ton	Rev.	Highways Trailer Co.
	1	Trailer	3 ton	Rev.	Kentucky Trailer
	1	Trailer	3 ton	Rev.	Keystone Trailer
	1	Trailer	3 ton	Rev.	Trailmobile
	8	Automobile	5	Co. Business	Chrysler
	2	Automobile	5	Co. Business	General Motors
Santa Fe Transportation Co. (California)	1	Bus	39	Rev.	Reo
	2	Truck	1½ ton	Rev.	Ford
	2	Truck	1½-2 ton	Rev.	Int. Harvester
	1	Trailer	10 ton	Rev.	Pike
Southern Kansas Greyhound Lines, Inc.	2	Bus	37	Rev.	a.c.f. Motors
Baltimore & Ohio					
Camden Warehouses	1	Automobile	2	.....	Dodge
Bangor & Aroostook	2	Bus	33	Rev.	General Motors
Bessemer & Lake Erie	1	Truck	¾ ton	Co. Business	Chevrolet
	1	Truck	2-3 ton	Co. Business	White
	2	Automobile	5	Co. Business	Studebaker
Birmingham Southern	1	Truck	½ ton	Co. Business	Ford
	2	Automobile	6	Co. Business	Ford
Boston & Maine	1	Truck	1 ton	Co. Business	Chrysler
	1	Truck	2 ton	Co. Business	Ford
Boston & Maine Transportation Co.	8	Bus	32	Rev.	General Motors
	5	Bus	36	Rev.	General Motors
Chesapeake & Ohio	1	Bus	....	Co. Business	Chevrolet
	3	Truck	½ ton	Co. Business	Chevrolet
	1	Truck	¾ ton	Co. Business	Chevrolet
	2	Automobile	5	Co. Business	Chevrolet
	1	Automobile	2	Co. Business	Plymouth
	1	Automobile	5	Co. Business	Pontiac
	1	Ambulance	....	Co. Business	LaSalle
Chicago & Illinois Midland	1	Truck	1 ton	Co. Business	Int. Harvester
Chicago & Western Indiana	1	Truck	2 ton	Co. Business	Int. Harvester
	2	Automobile	5	Co. Business	Ford
Chicago, Burlington & Quincy					
Burlington Transportation Co.	14	Bus	37	Rev.	a.c.f. Motors
	5	Bus	38	Rev.	General Motors
	2	Bus	18	Rev.	Flxible
	2	Bus	32	Rev.	Int. Harvester
	2	Bus	29	Rev.	Int. Harvester
Chicago, Milwaukee, St. Paul & Pacific	2	Truck	1½ ton	.....	.....
	1	Truck	¾ ton	.....	.....
	1	Tractor	....	.....	.....
	6	Trailer	....	.....	.....
	7	Automobile	5	.....	.....
	4	Automobile	7	.....	.....
Chicago, Rock Island & Pacific	2	Truck	1½ ton	Co. Business	General Motors
	2	Truck	1½ ton	Co. Business	Int. Harvester
	1	Truck	2 ton	Co. Business	Int. Harvester
	1	Truck	¾ ton	Co. Business	Int. Harvester
	4	Automobile	5	Co. Business	Ford
	2	Automobile	5	Co. Business	General Motors
Delaware, Lackawanna & Western	1	Truck	1½ ton	Co. Business	.....
	1	Truck	¾ ton	Co. Business	.....
Detroit, Toledo & Ironton	4	Automobile	5	Co. Business	Ford
Duluth, South Shore & Atlantic	1	Truck	½ ton	Co. Business	Chevrolet
Elgin, Joliet & Eastern	1	Truck	½ ton	Co. Business	Chrysler
	1	Truck	2 ton	Co. Business	Int. Harvester
	1	Truck	½ ton	Co. Business	Int. Harvester
	3	Automobile	....	Co. Business	General Motors
Erie	2	Truck	1½ ton	Co. Business	Int. Harvester
	5	Automobile	2	Co. Business	Chevrolet
	4	Automobile	5	Co. Business	Plymouth
	3	Automobile	5	Co. Business	Chevrolet
	1	Automobile	2	Co. Business	Plymouth

Purchaser	No.	Type of Vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Florida East Coast	1	Bus	21	Co. Business	Chevrolet
Fonda, Johnstown & Gloversville	4	Bus	32	Rev.	Mack
Great Northern	5	Truck	1½ ton	Co. Business	Int. Harvester
	1	Truck	1½ ton	Co. Business	Chrysler
	1	Truck	5 ton	Co. Business	General Motors
	1	Truck	2 ton	Co. Business	General Motors
	1	Truck	1½ ton	Co. Business	General Motors
	16	Automobile	....	Co. Business	General Motors
	3	Automobile	....	Co. Business	Chrysler
	1	Automobile	....	Co. Business	Ford
Gulf Coast Lines	2	Automobile	5	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Ford
Gulf, Mobile & Ohio					
Gulf Transport Co.	9	Bus	37	Rev.	General American Aerocoach Co.
	3	Tractor	2 ton	Rev.	General Motors
	2	Tractor	1½ ton	Rev.	Chevrolet
	1	Tractor	3½-4 ton	Rev.	General Motors
	2	Trailer	....	Rev.	Nabors
Illinois Terminal	1	Bus	33	Rev.	White
Long Island	1	Automobile	5	Co. Business	.....
Louisiana & Arkansas					
Louisiana, Arkansas & Texas Transportation Co.	1	Bus	29	.....	Flxible
	11	Truck	1½ ton	Rev.	Int. Harvester
	4	Truck	1½ ton	Rev.	Chevrolet
	2	Truck	¾ ton	Rev.	Int. Harvester
	1	Truck	¾ ton	Rev.	Ford
	11	Tractor	1½ ton	Rev.	Int. Harvester
	4	Tractor	1½ ton	Rev.	Chevrolet
	2	Tractor	1½ ton	Rev.	White
	11	Trailer	7½ ton	Rev.	Nabors
	5	Trailer	7½ ton	Rev.	Freuhauf
Maine Central					
Maine Central Transportation Co.	8	Bus	33	Rev.	General Motors
Maryland & Pennsylvania	1	Automobile	5	Co. Business	Chevrolet
Minneapolis, St. Paul & Sault Ste. Marie	2	Truck	½ ton	Co. Business	Chevrolet
	1	Truck	½ ton	Co. Business	Int. Harvester
	1	Truck	1½ ton	Co. Business	Int. Harvester
	1	Truck	¾ ton	Co. Business	Chrysler
	1	Tractor	.....	Co. Business	Clark Truk-tractor Co.
Mississippi Central	1	Truck	¾ ton	Co. Business	Pontiac
	2	Automobile	....	Co. Business	Pontiac
Missouri-Illinois	1	Automobile	5	Co. Business	Chevrolet
Missouri-Kansas-Texas	2	Bus	22	Co. Business	Chevrolet
	3	Automobile	....	Co. Business	Chevrolet
Missouri Pacific	2	Truck	½ ton	Co. Business	Chevrolet
	1	Truck	¾ ton	Co. Business	Chevrolet
	1	Truck	1½ ton	Co. Business	Chevrolet
	1	Truck	....	Co. Business	Chevrolet
	1	Truck	2 ton	Co. Business	Dodge
	1	Truck	1½ ton	Co. Business	Dodge
	2	Tractor	1½ ton	Co. Business	Chevrolet
	2	Trailer	....	Co. Business	Carter Mfg. Co.
	51	Automobile	5	Co. Business	Chevrolet
	8	Automobile	5	Co. Business	Plymouth
	3	Automobile	2	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Dodge
	1	Automobile	2	Co. Business	Ford
	1	Automobile	5	Co. Business	Hudson
Missouri Pacific Transportation Co.	12	Bus	33	Rev.	.....
	9	Bus	37	Rev.	.....
	4	Bus	29	Rev.	.....
Monongahela	1	Truck	1½ ton	Co. Business	Ford
Montour	1	Automobile	....	Co. Business	Plymouth
New York Central	1	Truck	4 ton	Co. Business	.....
	1	Truck	2-3 ton	Co. Business	.....
	1	Truck	1½ ton	Co. Business	.....
	1	Truck	½ ton	Co. Business	.....
Central Greyhound Lines	23	Bus	33	Rev.	General Motors
	14	Bus	37	Rev.	a.c.f. Motors
	3	Bus	27	Rev.	Ford
New York, Chicago & St. Louis	2	Automobile	5	Co. Business	Plymouth
	1	Automobile	5	Co. Business	Oldsmobile
New York, New Haven & Hartford	16	Truck	2½ ton	Co. Business	Fargo
	9	Truck	1½ ton	Co. Business	Fargo
	1	Automobile	5	Co. Business	Buick
New England Transportation Co.	10	Bus	41	Rev.	General Motors
Connecticut Company	25	Bus	36	Rev.	General Motors
	25	Bus	36	Rev.	Mack
	25	Bus	32	Rev.	Reo
	5	Bus	40	Rev.	General Motors
New York, Susquehanna & Western	1	Automobile	5	Co. Business	Buick
Norfolk & Western	2	Truck	1½ ton	Co. Business	Chevrolet
	2	Truck	¾ ton	Co. Business	Dodge
	2	Truck	1½ ton	Co. Business	Ford
	1	Truck	½ ton	Co. Business	Int. Harvester
	1	Automobile	5	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Ford
Norfolk Southern					
Norfolk Southern Bus Corp.	8	Bus	27	Rev.	Triangle Motors
	6	Bus	37	Rev.	General American Aerocoach Co.
	2	Bus	33	Rev.	a.c.f. Motors
	1	Bus	37	Rev.	C. D. Beck & Co.
	2	Tractor	....	Rev.	Autocar Sales & Service Co.
	2	Trailer	....	Rev.	Fruehauf
Northeast Oklahoma	1	Bus	23	Rev.	General Motors
	1	Bus	50	Rev.	Int. Harvester
	1	Bus	35	Rev.	Int. Harvester
Northern Pacific					
Northwestern Improvement Co.	1	Truck	1½ ton	Rev.	Chevrolet
Pacific Electric	95	Bus	45	Rev.	White

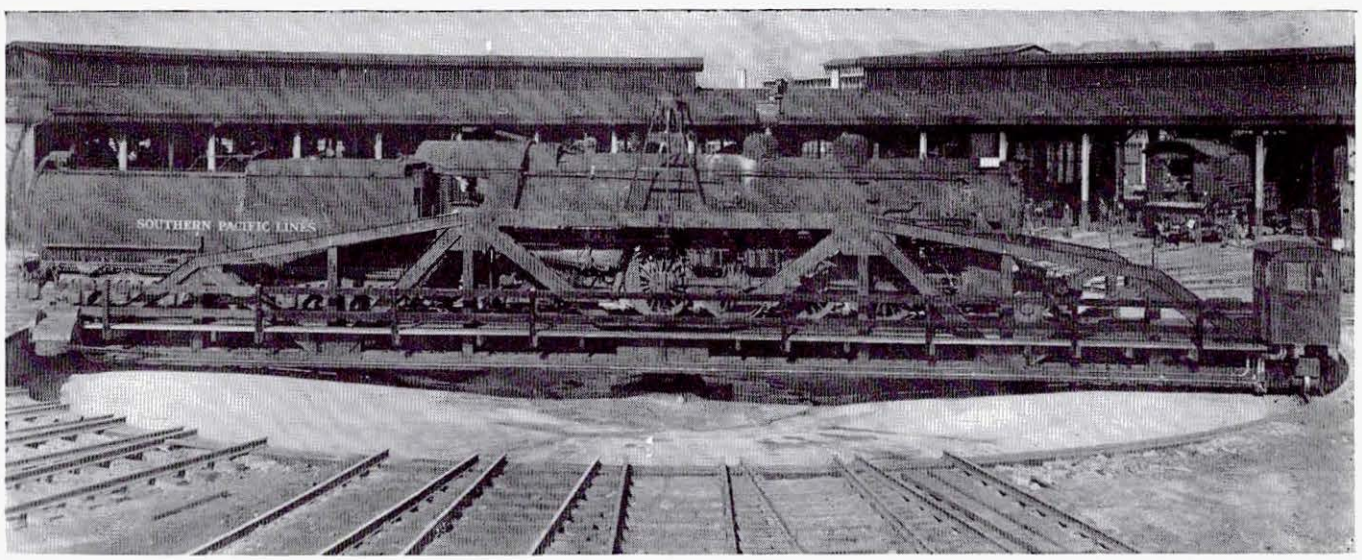
Purchaser	No.	Type of Vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Pennsylvania	1	Bus	12	Co. Business	
	1	Bus	8	Co. Business	
	22	Truck	1½ ton	Co. Business	
	7	Truck	¾ ton	Co. Business	
	6	Truck	1 ton	Co. Business	
	3	Truck	3 ton	Co. Business	
	2	Truck	5 ton	Co. Business	
	1	Truck	2 ton	Co. Business	
	1	Trailer	1¼ ton	Co. Business	
	1	Trailer	¾ ton	Co. Business	
	7	Automobile	5	Co. Business	
	1	Automobile	2	Co. Business	
Pennsylvania Affiliates	57	Bus	37	Rev.	
	3	Bus	29	Rev.	
	117	Truck	Less than 3 ton	Rev.	
	1	Truck	3-5 ton	Rev.	
	88	Tractor	Less than 3 ton	Rev.	
	8	Tractor	Over 10 ton	Rev.	
	3	Tractor	3-5 ton	Rev.	
	1	Tractor	5-10 ton	Rev.	
	68	Trailer	Over 10 ton	Rev.	
	3	Trailer	5-10 ton	Rev.	
	3	Trailer	3-5 ton	Rev.	
	3	Automobile	....	Co. Business	
Pennsylvania-Reading Seashore Lines	1	Automobile	6	Co. Business	Buick
	1	Automobile	5	Co. Business	General Motors
Pere Marquette	1	Truck	½ ton	Co. Business	Chevrolet
Pittsburgh & Shawmut	1	Automobile	....	Co. Business	Ford
	1	Automobile	....	Co. Business	Studebaker
Railway Express Agency	1,529	Truck	Light	.....	
	46	Tractor	....	.....	
	31	Trailer	....	.....	
	26	Automobile	....	.....	
Richmond, Fredericksburg & Potomac Richmond Greyhound Lines, Inc.	28	Bus	37	Rev.	General Motors General American Aerocoach Co.
St. Louis-San Francisco Frisco Transportation Co.	6	Bus	14	Rev.	Chevrolet
	3	Bus	23	Rev.	Chevrolet
	2	Bus	27	Rev.	General Motors
	1	Bus	36	Rev.	Chevrolet
	1	Bus	18	Rev.	Chevrolet
	1	Bus	11	Rev.	Chevrolet
	1	Bus	36	Rev.	General Motors
	1	Bus	18	Rev.	Int. Harvester
	1	Bus	11	Rev.	Plymouth
	3	Truck	1½ ton	Rev.	General Motors
	2	Truck	1½ ton	Rev.	Int. Harvester
	2	Truck	1½ ton	Rev.	Chevrolet
	1	Truck	1½ ton	Rev.	Dodge
	1	Truck	1½ ton	Rev.	Ford
	21	Tractor	1½ ton	Rev.	Chevrolet
	16	Tractor	1½ ton	Rev.	Dodge
	14	Tractor	1½ ton	Rev.	General Motors
	10	Tractor	1½ ton	Rev.	Int. Harvester
	6	Tractor	2 ton	Rev.	Diamond T
	6	Tractor	2 ton	Rev.	White
	6	Tractor	1½ ton	Rev.	White
	5	Tractor	1¼ ton	Rev.	Ford
	3	Tractor	2 ton	Rev.	Int. Harvester
	3	Tractor	2 ton	Rev.	Mack
	2	Tractor	3 ton	Rev.	White
	1	Tractor	1½ ton	Rev.	Autocar Sales & Service Co.
	1	Tractor	1½ ton	Rev.	Diamond T
	1	Tractor	2 ton	Rev.	Dodge
	1	Tractor	3 ton	Rev.	General Motors
	1	Tractor	2½ ton	Rev.	General Motors
	1	Tractor	2 ton	Rev.	General Motors
	1	Tractor	1½ ton	Rev.	Mack
	1	Tractor	2½ ton	Rev.	White
	45	Trailer	10 ton	Rev.	Superior Trailer Mfg. Co.
	16	Trailer	10 ton	Rev.	Springfield Wagon & Trail
	8	Trailer	9 ton	Rev.	Superior Trailer Mfg. Co.
	4	Trailer	9 ton	Rev.	Ft. Smith Structural Steel
	4	Trailer	10 ton	Rev.	Freuhauf
	3	Trailer	10 ton	Rev.	Ft. Smith Structural Steel
	2	Trailer	10 ton	Rev.	Dix
	2	Trailer	10 ton	Rev.	Keystone Trailer
	1	Trailer	10 ton	Rev.	Bartlett
	1	Trailer	9 ton	Rev.	Dart
	1	Trailer	9 ton	Rev.	Fruehauf
	1	Trailer	10 ton	Rev.	Herman
	1	Trailer	11 ton	Rev.	Kingham
	1	Trailer	10 ton	Rev.	Kingham
	1	Trailer	10 ton	Rev.	Standard
	1	Trailer	11 ton	Rev.	Springfield Wagon & Trail
St. Louis Southwestern Southwestern Transportation Co.	3	Trailer	1½ ton	Rev.	Hobbs Trailer Co.
	1	Automobile	5	Co. Business	Ford
Southwestern Greyhound Lines	28	Bus	37	Rev.	General American Aerocoach Co.
	20	Bus	37	Rev.	General Motors
	7	Bus	33	Rev.	General Motors
	4	Bus	33	Rev.	Peterson Auto Co.
Seaboard Air Line	8	Truck	....	Co. Business	Int. Harvester
	5	Truck	....	Co. Business	Chrysler
	5	Truck	....	Co. Business	General Motors
	2	Tractor	....	Rev.	Fruehauf
	1	Tractor	....	Rev.	Mack
	1	Tractor	....	Rev.	Reo
	1	Tractor	....	Co. Business	a.c.f. Motors

Purchaser	No.	Type of Vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Seaboard Air Line (*cont'd.*)	36	Automobile	5	Co. Business	General Motors
	6	Automobile	5	Co. Business	Chrysler
	2	Automobile	5	Co. Business	Ford
	2	Automobile	2	Co. Business	General Motors
	1	Automobile	5	Co. Business	Hudson
	1	Automobile	2	Co. Business	Studebaker
Southern	1	Truck	1½ ton	Co. Business	Chevrolet
	1	Truck	2 ton	Co. Business	White
Southern Pacific	4	Automobile	2	Co. Business	.....
Spokane International	1	Truck	½ ton	Co. Business	General Motors
	2	Automobile	5	Co. Business	Ford
Texas & New Orleans	1	Bus	6	Co. Business	Chrysler
	1	Truck	¾ ton	Co. Business	Chevrolet
	1	Truck	1 ton	Co. Business	Ford
	1	Automobile	5	Co. Business	Chevrolet
	1	Automobile	2	Co. Business	Chevrolet
Southern Pacific Transport Co.	2	Truck	1½ ton	Rev.	Int. Harvester
	1	Truck	1 ton	Rev.	Mack
	7	Tractor	1½ ton	Rev.	Chevrolet
	2	Tractor	1½ ton	Rev.	Ford
	1	Tractor	1½ ton	Rev.	Dodge
	1	Tractor	1½ ton	Rev.	General Motors
	1	Tractor	1½ ton	Rev.	Mack
	5	Trailer	1½ ton	Rev.	Nabors
	3	Trailer	1½ ton	Rev.	Hobbs Trailer Co.
	2	Trailer	1½ ton	Rev.	Trailmobile
	1	Trailer	1½ ton	Rev.	Fruehauf
	1	Trailer	1½ ton	Rev.	Mack
Texas & Pacific	3	Automobile	5	Co. Business	Ford
	2	Automobile	5	Co. Business	General Motors
	1	Automobile	5	Co. Business	Chrysler
	1	Automobile	2	Co. Business	Ford
Texas & Pacific Motor Transport Co.	3	Truck	2½ ton	Rev.	Chevrolet
	5	Tractor	2½ ton	Rev.	Int. Harvester
	1	Tractor	2½ ton	Rev.	General Motors
	2	Trailer	7 ton	Rev.	Hobbs Trailer Co.
	1	Trailer	10 ton	Rev.	Highways Trailer Co.
Union Pacific	1	Truck	1½ ton	Co. Business	General Motors
	1	Truck	1½-2 ton	Co. Business	Int. Harvester
	1	Truck	1½ ton	Co. Business	Int. Harvester
Wheeling & Lake Erie	3	Bus	8	Co. Business	Chrysler
	3	Bus	8	Co. Business	Int. Harvester
	2	Bus	8	Co. Business	Oldsmobile
	1	Bus	8	Co. Business	Ford
	2	Truck	½ ton	Co. Business	Dodge
	1	Truck	¾ ton	Co. Business	Chevrolet
	1	Truck	1½ ton	Co. Business	Dodge
	1	Truck	½ ton	Co. Business	Ford
	1	Truck	¾ ton	Co. Business	Int. Harvester
	1	Truck	½ ton	Co. Business	Int. Harvester
	1	Automobile	3	Co. Business	Dodge
Wisconsin Central	2	Truck	¾ ton	Co. Business	Chevrolet
	1	Truck	½ ton	Co. Business	Chevrolet

Canada

British Columbia Electric	18	Bus	31	Rev.	Twin Coach
	6	Bus	27	Rev.	Ford
National Harbours Board	1	Truck	1½ ton	Co. Business	General Motors
	1	Automobile	5	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Ford
Quebec Central					
Quebec Central Transportation Co.	2	Bus	33	Rev.	General Motors

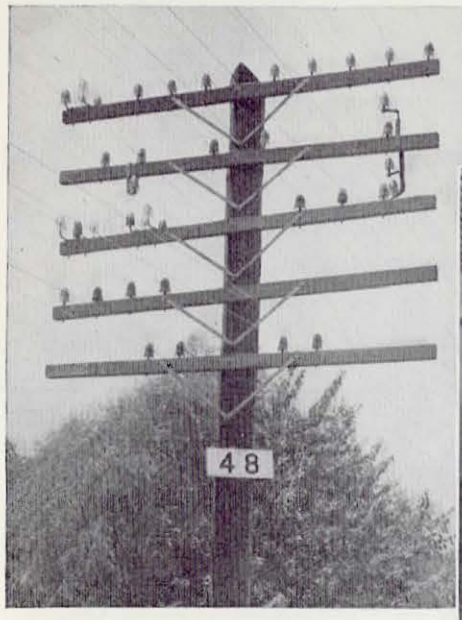
* * *

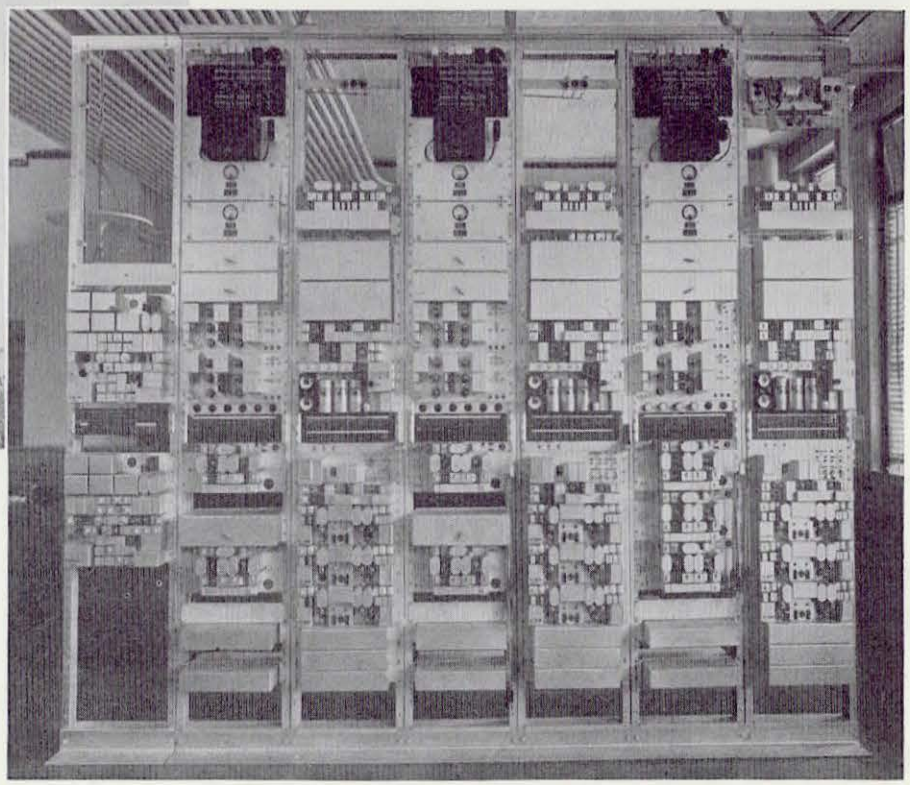


This New Southern Pacific 110-Ft. Electrically Driven Turntable Will Operate At 175 Ft. Per Minute, Loaded

Two 25-horsepower Westinghouse Type CI, wound-rotor induction motors, gear-connected to friction drive wheels, rotate the structure. Locomotive and tender pictured above are 97 ft., 8½ in. long, and weigh 659,100 lb. loaded.

Railroad T. & T. Construction In 1942





Above—Line Pole With Point Type Transposition Bracket. Right — Carrier Equipment in a Railroad Office

More telephones and printing telegraph on circuits using carrier systems to save line wires

John H. Dunn

Associate Editor

AS a means for providing additional communication to meet the demands brought about by war traffic, the railroads not only used existing telegraph and telephone facilities more intensively during 1942 than ever before, but more new facilities were also added than in several previous years.

Shippers and consignees are demanding more exact information on the progress of cars in transit. In order to meet this need and also to save time in preparing switching lists before trains arrive, the consists are being transmitted more generally by printer telegraph to the yards before the trains arrive. The number of diversion orders and reconsignments of cars in transit have increased. Empty freight cars must be spotted when loads are ready, but not before, and when loaded the cars must be moved at once. On account of the scarcity of accommodations, passengers demand assurance by telegraph that reservations have been made. Within one 24-hour period, several thousand messages, having to do with troop movements, were handled through the railroad offices in one city. All these conditions have created an unprecedented volume of message traffic.

On account of the intensity with which the railroads are operating, many matters which formerly could be handled by letters, must now be settled quickly by telegraph or telephone. Long-distance telephone circuits between division headquarters and general offices are so busy that executive and operating officers as well as others are coming onto the job earlier in the morning and staying later than usual in the evening to complete transactions which must be handled by telephone.

In order to relieve the load on communication facilities, railroad employees have been cautioned not to send telegrams or use telephones unless necessary. On the other hand, the communications departments cannot determine the importance of messages or telephone calls, and therefore face the necessity for handling whatever load may develop. Born of this condition, numerous practices have been adopted to utilize existing communication circuits and apparatus more intensively and for longer hours each day. Beyond these efforts, the only alternative is to add more facilities.

Under the circumstances, no pole lines are being reconstructed and no new pole lines are being built unless such construction can not be deferred without likelihood of losing the lines in storms. During 1942, new pole

lines, or reconstruction so extensive as to be practically equivalent to a new line, was completed on 3,374 miles of railroad-owned lines; on 3,353 miles of commercially-owned lines, and on 1,873 miles of lines owned jointly by railroad and commercial companies. This combined

Principal New and Rebuilt Pole Line Construction and New Line Wire Installed in The United States and Canada During 1942

Railroad	New or Rebuilt Pole Lines: Miles of Railroad Owned	New or Rebuilt Pole Lines: Commercially Owned	New or Rebuilt Pole Lines: Jointly Owned	Miles of New Copper Wire: Railroad Owned	Miles of New Copper Wire: Commercially Owned
A. T. & S. F.	..	..	211	1,495	147
B. & O.	1	..	..	381	..
C. N.	..	..	739	48	1,332
C. P.	565	..	..	758	769
C. & O.	223	..	..	27	..
C. & E. I.	..	..	130	..	..
C. B. & Q.	397	110	..	1	..
C. M. St. P. & P.	..	..	..	165	..
C. R. I. & P.	..	196	..	..	..
D. & H.	8	37	..	143	..
G. N.	228	..	..	1,646	25
G. M. & O.	..	..	..	660	..
I. C.	91	199	..	..	..
L. & A.	..	..	..	624	..
M. St. P. & S. Ste. M.	141	..	234	..	..
M. P.	..	170	..	187	..
N. C. & St. L.	139	..	..	..	..
N. Y. C.	..	327	8	166	..
N. Y. N. H. & H.	..	124	..	..	22
N. & W.	..	186	..	..	..
N. P.	221	..	249	886	105
Penna.	414	..	..	30	..
St. L.-S. F.	..	122	..	..	..
St. L. S.	..	178	..	..	..
S. A. L.	4	504	..	18	351
S. P.	..	707	..	190	506
T. & N. O.	..	60	..	164	16
U. P.	..	..	185	458	542
Wabash	..	115	..	..	..

total of 8,600 miles exceeds the 7,168 miles for the preceding year. About 8,770 miles of new line wire, for either new circuits or replacements, was installed by the railroads, and 3,864 miles was installed jointly by the railroads and the commercial companies. The total of 12,634 miles of line wire is a decrease from the 13,353 miles installed in 1941.

On account of the necessity for conserving metals as a part of the war program, no new line wires were in-

New Mileage of Telephone Train Dispatching and Long-Distance Telephone Circuits Placed in Service During 1942

	New Miles of Road Dispatched by Telephone	Miles of New Long-Distance Telephone Circuits
Atchison, Topeka & Santa Fe	22	1,545
Baltimore & Ohio	151	..
Canadian Pacific	..	1,376
Chicago & Eastern Illinois	..	54
Chicago, Burlington & Quincy	..	140
Chicago, Indianapolis & Louisville	118	..
Chicago, Milwaukee, St. Paul & Pacific	83	..
Chicago, Rock Island & Pacific	..	2,086
Delaware & Hudson	84	..
Denver & Rio Grande Western	..	43
Erie	..	85
Great Northern	360	661
Gulf, Mobile & Ohio	826	149
Minneapolis, St. Paul & Sault Ste. Marie	266	120
Missouri Pacific	12	169
New York,, New Haven & Hartford	..	431
Northern Pacific	105	435
Pennsylvania	7	110
Reading	..	69
Seaboard Air Line	42	167
Southern Pacific	..	118
Southern	..	698
Texas & New Orleans	18	683
Union Pacific	53	556

stalled if other means could be devised for using existing wires more intensively. Although only 12,634 miles of line wire was installed for new circuits and replacements of old wire during 1942, a total of at least 29,486 circuit miles were placed in service. Part of this mileage was derived by converting from telegraph to telephone service. To a much greater extent, however, the additional circuit mileage was derived by using existing wires to handle more than one message or telephone conversation simultaneously. These results were obtained either by using conventional methods, such as phantom and simplex, or by installing carrier apparatus to superimpose high-frequency channels on wires used also for other forms of transmission.

Assignments of New Circuits

Without regard to the means by which new circuits were obtained, i. e., by change from telegraph to telephone, Morse telegraph to printer, by simplex, or by new carrier equipment, the point of interest is the applications of these new circuits for different forms of communication. During 1942, telephone train dispatch-

Principal Increases In Communication Plant Facilities In the United States and Canada During 1942, As Compared With 1940 and 1941

	1942	1941	1940
Miles of new or rebuilt pole line:			
Railroad owned	3,374	2,742	2,440
Commercially owned	3,353	3,069	3,319
Jointly owned	1,873	1,357	1,713
Total	8,600	7,168	7,472
Miles of new copper wire:			
Railroad owned	8,770	8,504	4,233
Commercially owned	3,864	4,849	1,832
Total	12,634	13,353	6,065
Gross increase in miles of road dispatched by telephone	2,153	1,296	519
Increase in miles of long-distance telephone circuits	9,763	9,607	8,797
New mileage of telegraph circuits, all types	1,870	5,221	3,965
Increase in miles of printing telegraph circuits	13,840	12,217	15,108
Number of new printing telegraph machines	160	196	163
Increase in circuit miles of new carrier-current systems	18,372	9,695	9,824

ing was placed in service on 2,316 miles of road, as compared with 1,296 miles in 1941. The most extensive dispatching projects in 1942 were on 826 miles of the Gulf, Mobile & Ohio, 359 miles of the Great Northern, and 266 miles of the Minneapolis, St. Paul & Sault Ste. Marie.

A total of 9,763 circuit miles of long-distance telephone circuits were installed during 1942, as compared with 9,607 miles in 1941. The most extensive long-distance telephone service installed in 1942 was 2,085 circuit miles on the Chicago, Rock Island & Pacific; 1,545 circuit miles on the Atchison, Topeka & Santa Fe;

Principal Printing Telegraph Installations Completed in the United States and Canada During 1942

	Miles of Circuit	Number of Machines
Atchison, Topeka & Santa Fe	1,676	..
Canadian National	2,123	38
Canadian Pacific	7,073	49
Chicago, Milwaukee, St. Paul & Pacific	113	2
Chicago, Rock Island & Pacific	181	3
Chicago, St. Paul, Minneapolis & Omaha	40	..
Illinois Central	127	2
Northern Pacific	545	8
Pennsylvania	623	16
Texas & New Orleans	242	18
Union Pacific	957	8
Western Pacific	138	3

and 1,376 circuit miles on the Canadian Pacific. On the Rock Island, all of the circuit mileage was obtained by the installation of Western Electric Company carrier equipment. The Type-C three-channel voice carrier was installed on 1,500 circuit miles between Chicago and Kansas City, Mo.; the Type-H single-channel voice carrier was provided on 211 circuit miles between El Reno, Okla. and Ft. Worth, Tex., as well as on 374 circuit

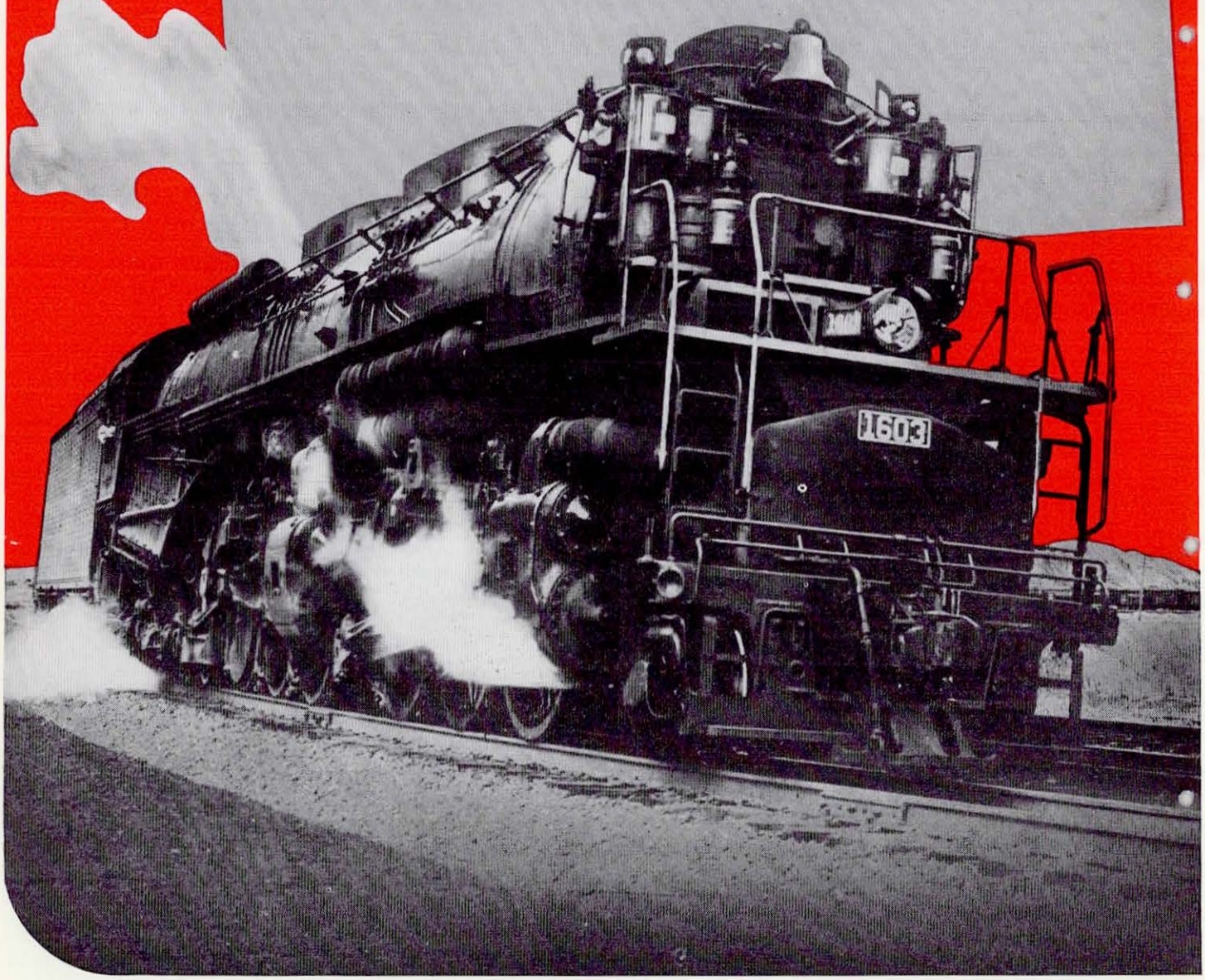
Continued on second left-hand page

Fighters

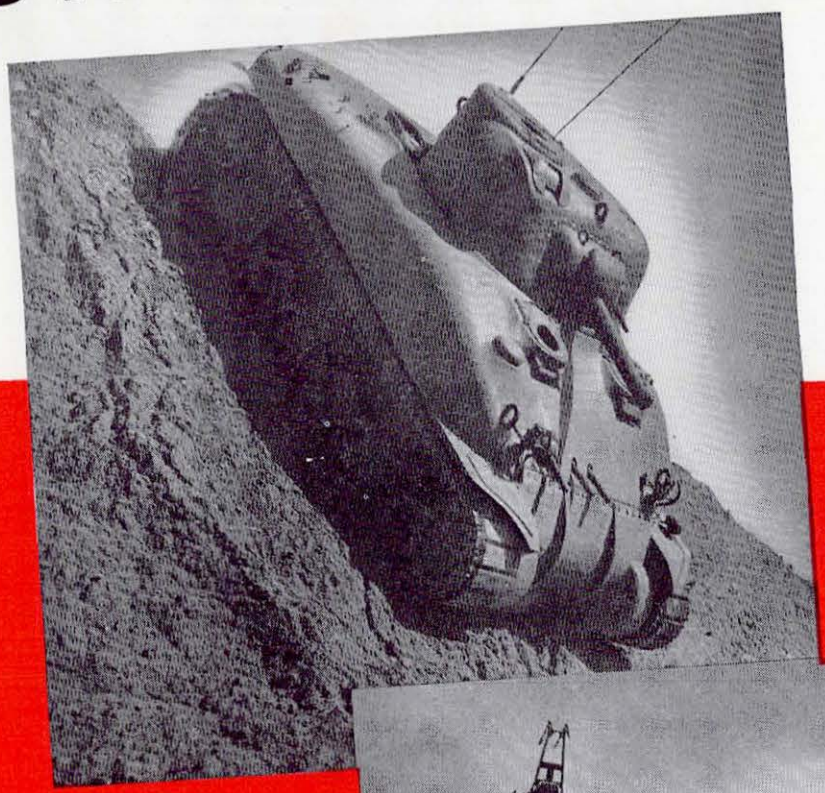
High above the desert the Nazi dawn patrol seeks to sight the long lines of Lima-built M-4 tanks he knows are rolling forward into position. Through lush Pacific jungles, other Lima-built "General Shermans" smash their way — teaching war-mad Japs the fact that war *is* hell!

A year ago British civilian demolition squads fought in London's Battle of the Blitz, using Lima crawler cranes to clear vital areas quickly. Today, Lima cranes are swinging the war effort along at a thousand points from Eritrea to Australia and Lima-built Army locomotives are performing valiantly in the Service of Supply on far flung fronts.

On the home front Lima locomotives serve to speed forward the greatest output of munitions the world has ever seen—keeping 'em rolling faster, faster, faster!



ON EVERY FRONT



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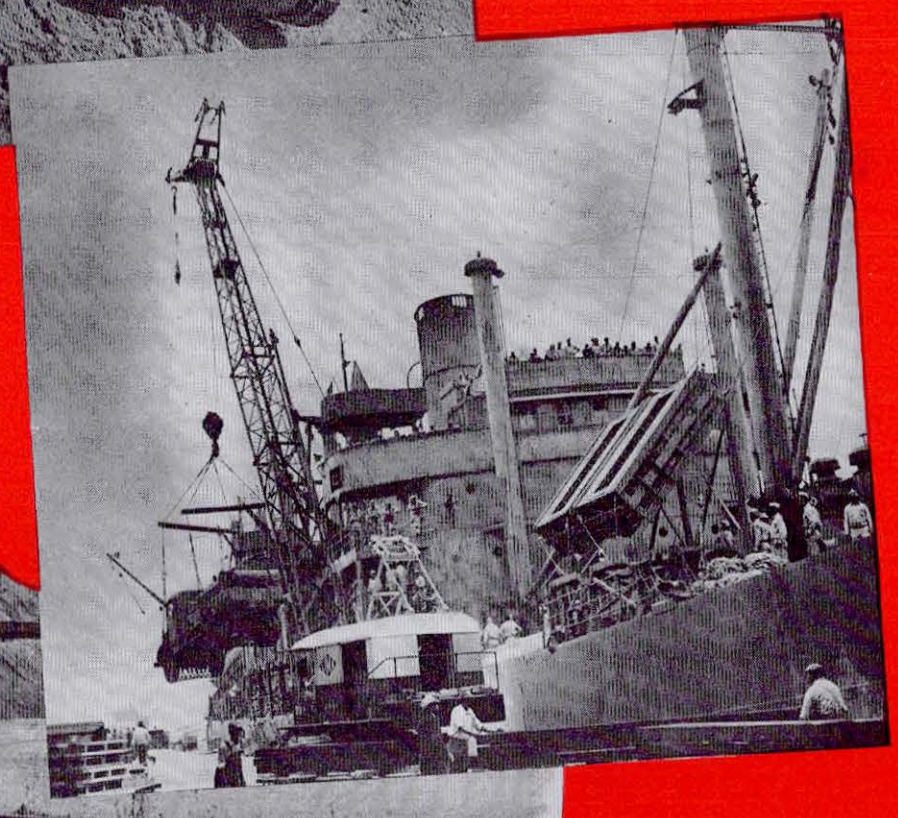
CRANE...
LOCOMOTIVE...

each is Lima-built through and through. Built with that same skill and care and devotion to perfection that has made Lima-built a watchword of the railroad world for three-quarters of a century.



LIMA LOCOMOTIVE WORKS — LIMA LOCOMOTIVE WORKS INCORPORATED — INCORPORATED, LIMA, OHIO

miles between Herrington, Kan. and Dalhart, Tex., and the Type 12-B single-channel voice carrier was installed in 136 circuit miles between Pratt, Kan., and Liberal. The Canadian Pacific obtained 1,270 circuit miles of new long-distance telephone service by installing carrier apparatus. The Denver & Rio Grande Western installed the Communication Equipment & Engineering Company's two-channel carrier system superimposed on an existing telephone dispatching line circuit, on 899 circuit miles between Denver, Colo., and Grand Junction.

Circuit Mileage Derived by Carrier Installations in 1942

Railroad	Circuit Miles
A. T. & S. F.	1,010
C. N.	1,425
C. P.	5,770
C. & O.	254
C. I. & L.	118
C. R. I. & P.	2,221
D. & R. G. W.	899
G. N.	442
G. M. & O.	826
M. St. P. & St. S. M.	442
M. P.	279
N. Y., N. H. & H.	157
N. & W.	101
Pennsylvania	314
St. L.-S. W.	71
S. A. L.	313
Southern	627
T. & N. O.	615
U. P.	427
W. P.	746

Printing Telegraph Installed

As a means for increasing the capacity to handle messages, the railroads installed 160 printing telegraph machines, as compared with 196 in 1941. In 1942, the Canadian Pacific installed 49 printing telegraph machines, the Canadian National 38, the Union Pacific 18, and the Pennsylvania 16 machines.

For the operation of the new telegraph printing machines, as well as extensions of circuits for such machines previously in service, the railroads assigned a total of 13,840 circuit miles during 1942, as compared with 12,217 miles in 1941. These line circuits were devised in various ways, by converting from Morse telegraph, by simplexing and by installing carrier. For example, by installing carrier apparatus, the Canadian Pacific obtained 5,770 circuit miles, the Canadian National 1,425 miles, and the Union Pacific 956 miles.

One Way to Alleviate the Manpower Shortage

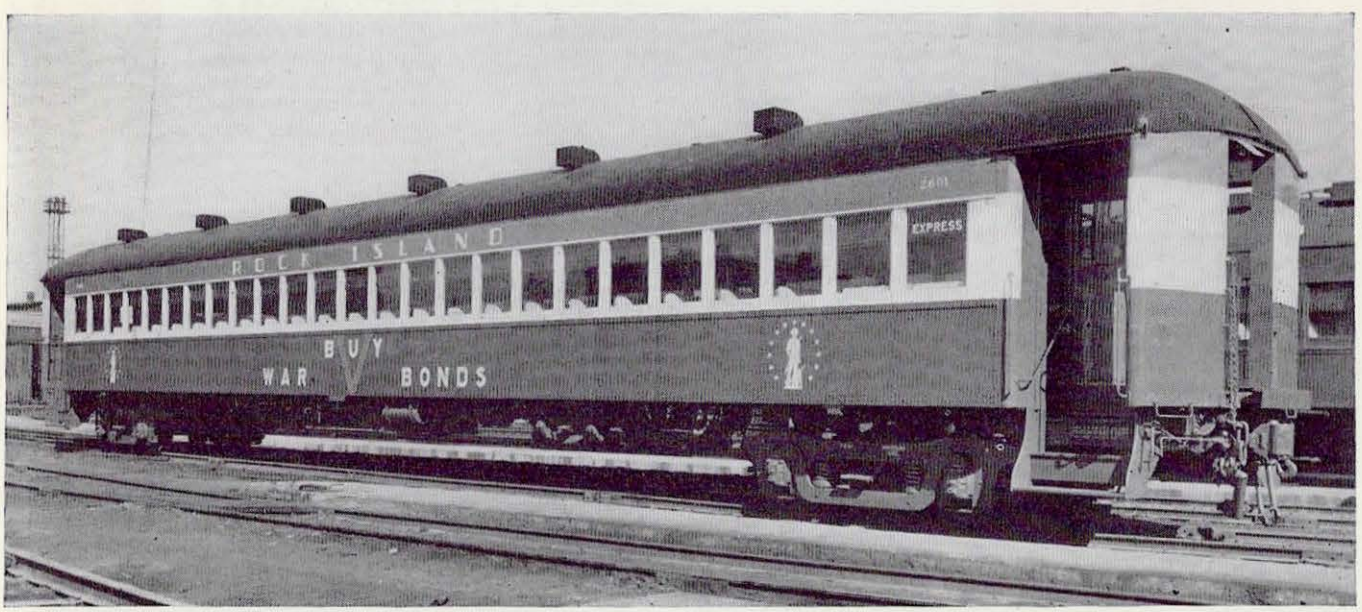
"Labor unions must be asked to give up the rules and practices they have built up over years to compel the creation of additional jobs. The railroad 'full-crew' laws must be abandoned in so far as they are not needed for safety but merely for creating jobs. Thurman Arnold has performed a public service by citing endless 'feather-bed' practices of this sort. He has told of union barriers against the use of spray guns for painting; of union efforts to prevent the use of prefabricated materials in building; of unions that require employers to hire a man who has nothing to do but turn on a switch.

"We cannot afford these luxuries and follies in wartime. We cannot allow unions to force business men to employ useless labor. We cannot allow them to restrict the efficient use of men and machines. We can no longer tolerate unions insisting, as in Chicago, that employers cannot bring in truck cement mixers unless they hire extra men to stand around and watch. We can no longer tolerate unions forcing employers to 'employ' a new truck driver, whether he works or not, when a truck has crossed a State line. We can no longer allow unions to force on consumers a luxury system of milk delivery.

"We can no longer permit union plumbers to insist on cutting off the threaded ends of delivered pipes, so that they may do the job over. We can no longer allow union electricians to tear electrical wiring out of prefabricated houses so that they may reinstall wiring. We can no longer allow theatrical scene shifters to insist that a 'full crew' of scene shifters be employed even in plays where there is no scenery. We can no longer tolerate the 'stand-in' orchestra, or, in fact, the whole fantastic system of made work that Mr. Petrillo insists on imposing.

"It would be pleasant to think that we could get union leaders to change their rules in this respect by voluntary agreement. Experience shows, however, that this is not possible. . . ."

—From the New York Times.



A Rock Island Suburban Car Boosts Bonds

This red, white and blue suburban coach is being operated by the Chicago, Rock Island & Pacific to publicize war bonds.

Railroads-in-War News

Rail's 1942 Job Tops All Records

Traffic was heaviest that any form of transport ever moved, Pelley says

Calling railroad performance last year "one of the outstanding features in connection with the prosecution of the war," J. J. Pelley, president of the Association of American Railroads, in a year-end statement issued this week, emphasized that the 1942 traffic comprised the greatest volume that "any form of transportation in the world has ever been called upon to move in any corresponding period."

Reviewing the year, Mr. Pelley said:

"Despite the unprecedented volume, railroads transported it without congestion. Some temporary stringencies in certain types of equipment have occurred but there has been no interference with the war effort because of inability of shippers to obtain cars. The volume handled by the roads amounted to 630,000,000,000 ton-miles. This was 155,000,000,000 ton-miles, or nearly 33 per cent greater than that handled in 1941, the previous record year. It was more than one and one-half times the volume moved in the first World War year 1918.

"This heavy increase in ton-miles resulted from the heavier loading of freight cars and longer haul per ton, carloadings in 1942 having been little more than one per cent greater than in the preceding year. Freight loadings approximated 42,800,000 cars in the current year, an increase of 510,000 cars above 1941.

"At the same time, railroads established a new high record in volume of passenger traffic in 1942. Passenger-miles (the number of passenger multiplied by the distance carried) totaled 53,000,000,000. This exceeded by more than 6,000,000,000 passenger-miles, or 13 per cent, the previous record established in 1920. It also exceeded 1941 by more than 23,000,000,000 passenger-miles, or 80 per cent.

"Part of this heavy passenger traffic in 1942 can be attributed to troop movements, approximately 2,000,000 members of our armed forces now being transported monthly in organized movements.

"Railroads this year have been faced with the most rapid increase in passenger traffic in their history. In the first three months, that traffic was only forty per cent above the same period in 1941. The second quarter saw an increase to 67 per cent, and in the third quarter, the increase was 90 per cent. For the fourth quarter, an increase of 116 per cent is estimated. Railroads now are moving twice as great a volume of passenger traffic as they did at this time last year but with the same amount of equipment, as they have been unable to acquire more. Because of that situation, passengers have suffered some inconveniences. The railroads, though, appreciate the sympathetic cooperation of the traveling public in helping to meet the tremendous passenger traffic problem which the carriers face.

"Not only are railroads today furnishing the country with the greatest freight service in history, but they are receiving less for hauling a ton of freight one mile than at any time since 1918. The average revenue per ton-mile is now only 0.927 cent.

"Railroads have been able to meet transportation demands in 1942 because of improvements in equipment construction and a continuous improvement in operating efficiency. This has enabled them to get the utmost utilization not only out of their freight and passenger equipment, but also their tracks and other facilities, in order to assure an uninterrupted performance of the enormously increased service that is being demanded of them. Every efficiency factor in 1942 has shown an improvement compared with the preceding year, except that of train speeds. The average speed of both freight and passenger trains in the current year was slightly less than in 1941 but this has been more than compensated for by the increase in the amount of freight and number of passengers carried per train.

"Among the outstanding efficiency records established by the railroads in 1942 were the following:

"1. Average load of freight per train was 1,030 tons, the highest on record. In 1941, it was 915 tons.

"2. Performance per freight train has more than doubled, gross ton-miles per freight train hour having increased from 16,555 in 1921 to 35,874 in 1942, while net ton-miles per freight train hour increased from 7,506 in 1921 to 16,216 in 1942.

"3. For each pound of fuel used in freight service in 1942, railroads hauled 9.2 tons of freight and equipment one mile compared with 6.2 tons in 1921.

"4. The average load per freight car was 31½ tons in 1942, the highest on record.

"5. The average haul of freight shipments in 1942 broke all records, increasing by approximately fifty miles compared with the preceding year.

"6. Average daily movement of freight cars was 49 miles in 1942, a new high record, and an increase of 90 per cent compared with 21 years ago.

"7. Average passengers per car and per train broke all previous records by a wide margin, the load per car being more than 40 per cent and the load per train being more than 60 per cent greater than in 1941.

"8. Average capacity of freight cars was 50½ tons in 1942, the highest on record.

(*Continued on page 143*)

New Railway Aides Named by Eastman

Harstad and Hayes bring long experience to their new posts with ODT

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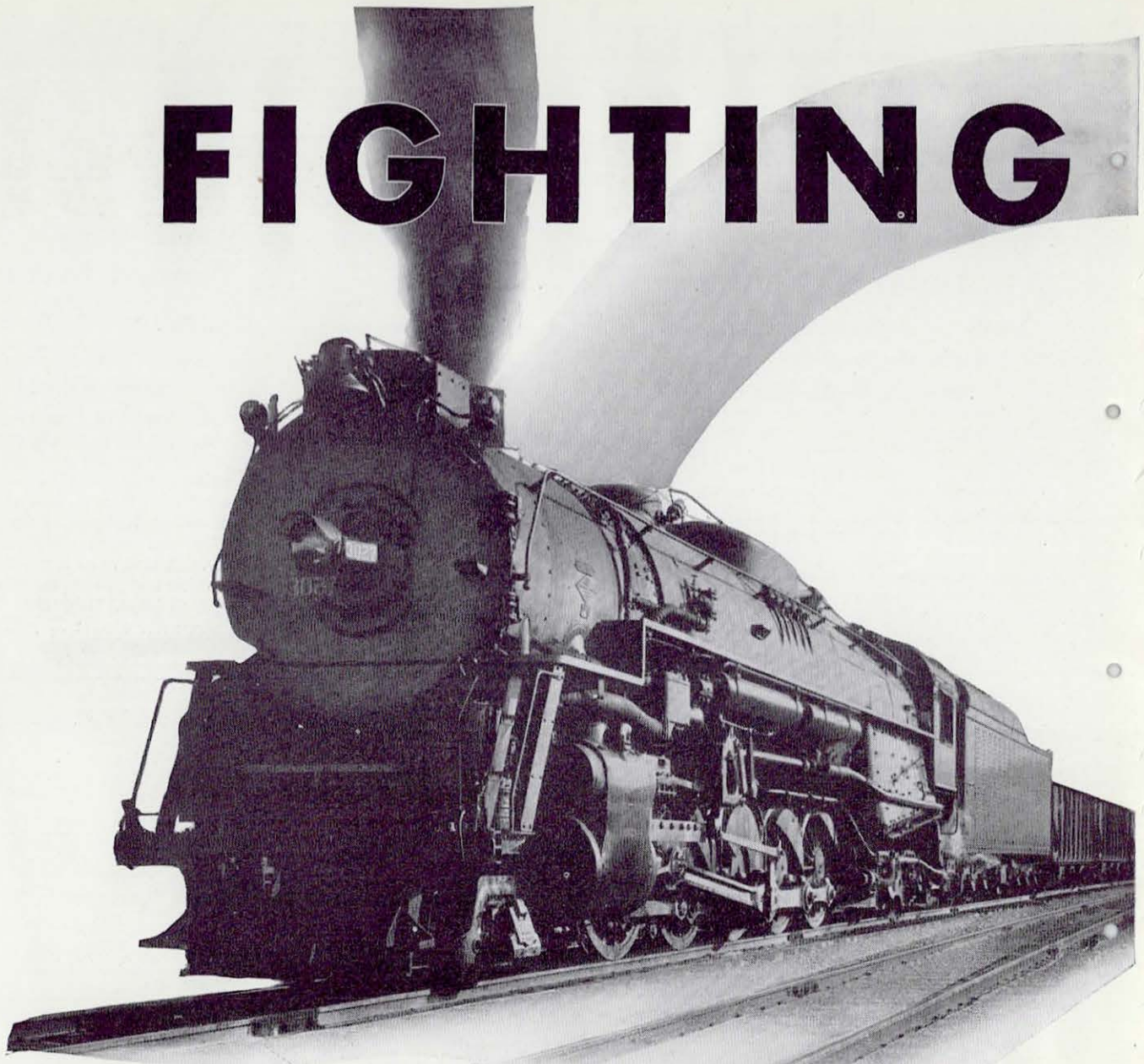

100% out on war work, Franklin Railway Supply Company, Inc., and its manufacturing division, the Balmar Corporation, fights on land . . . in the air . . . and on the sea.

On land, Franklin's locomotive specialties are increasing the efficiency and the capacity of many of the locomotives that are speeding to the front the nation's ever-increasing flood of men and munitions.

In the air, the latest models produced by several large manufacturers of airplanes are proving by their outstanding performance the quality and accuracy of certain units furnished by us.

On the sea, the rapid expansion of the Fleets of Liberty Ships is also aided by the production facilities of our shops.

We are sincerely grateful to the railroads of America, and those firms which have honored us with their war work, for their confidence in us . . . and for the opportunity they have given us to play our part in the great common effort to maintain forever the American way of life.

FRANKLIN RAILWAY SUPPLY

In Canada: **FRANKLIN RAILWAY**

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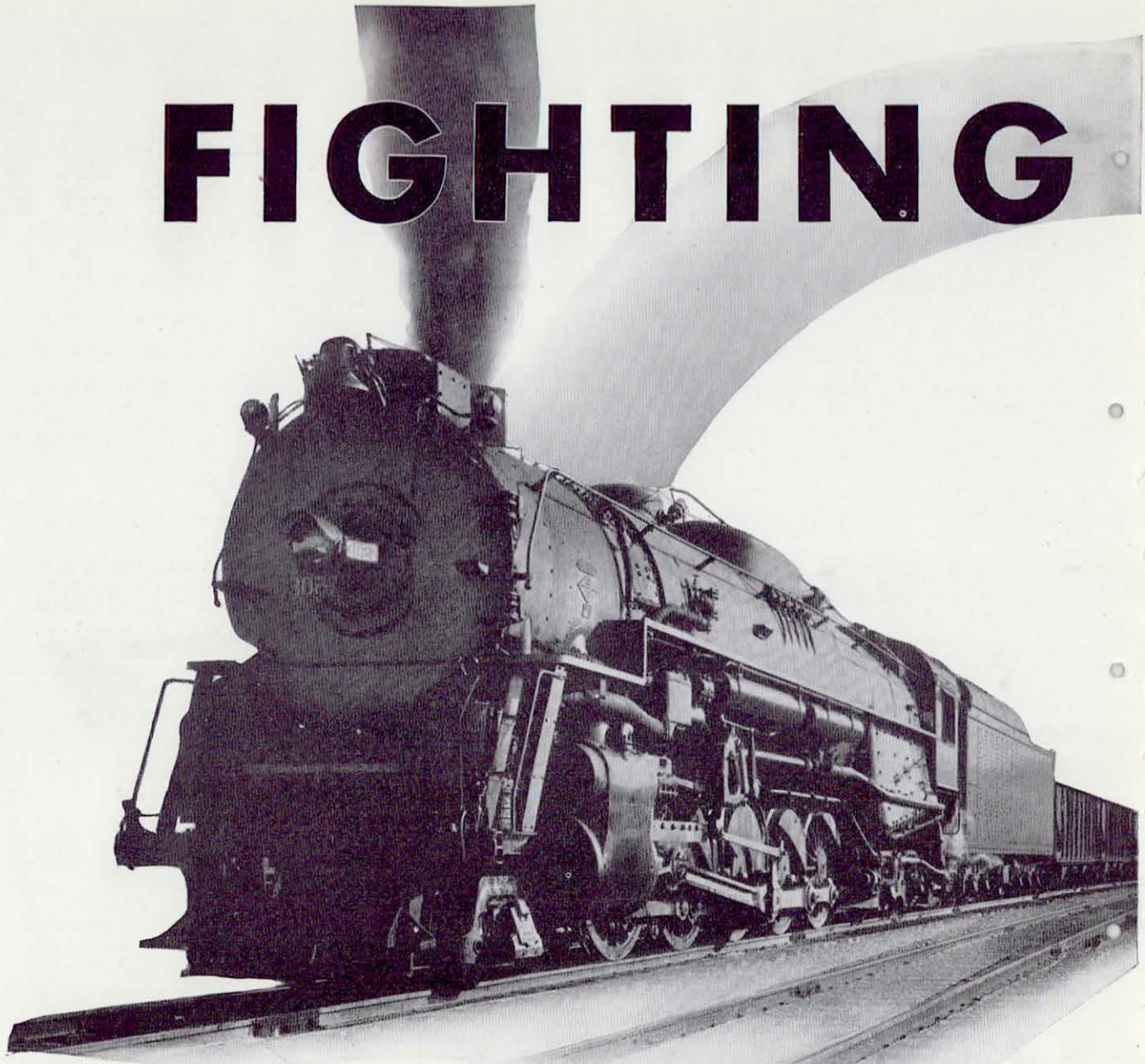

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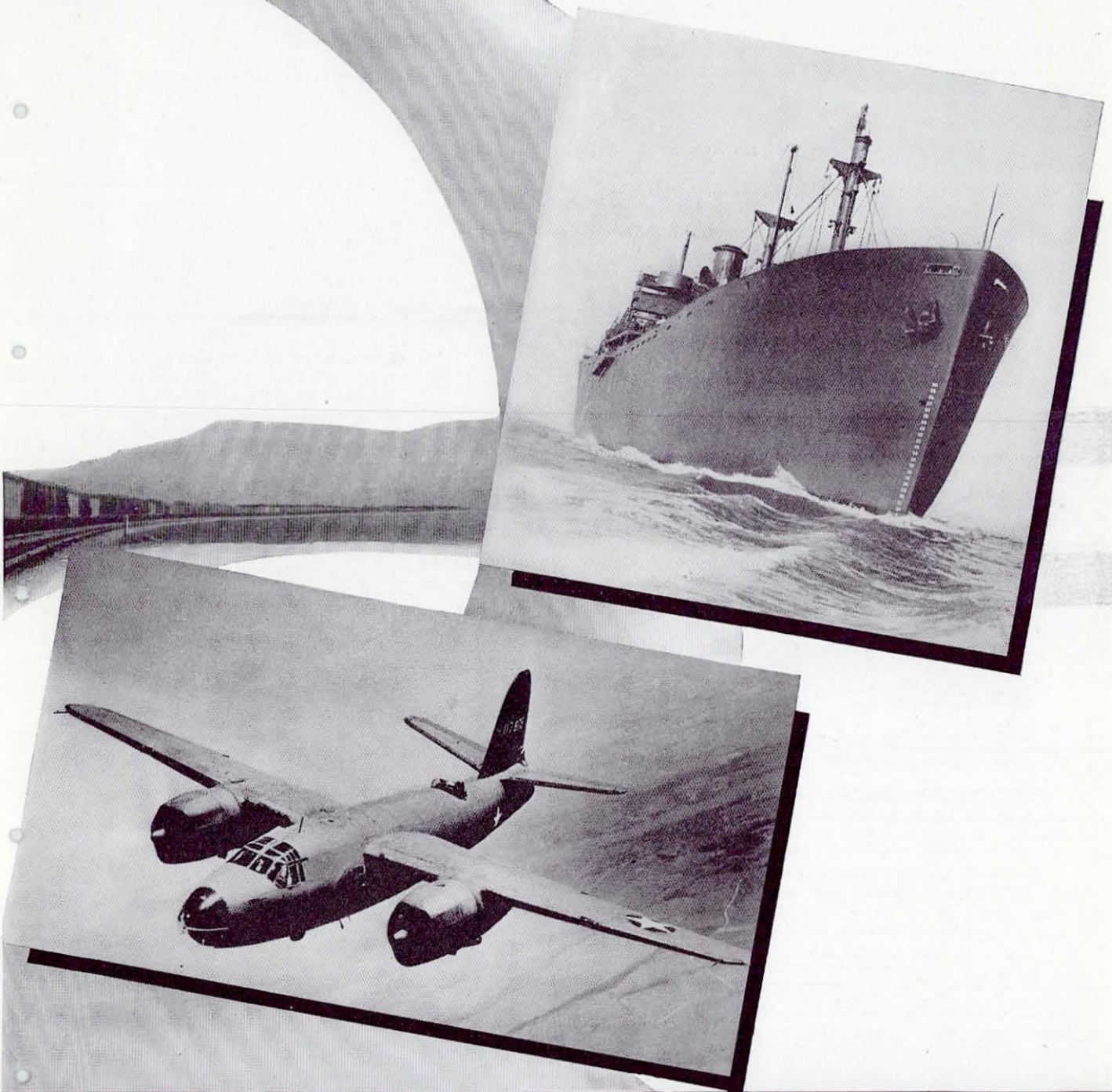
FRANKLIN RAILWAY SUPPLY

In Canada: **FRANKLIN RAILWAY**

on all fronts!



COMPANY, INC. NEW YORK CHICAGO

SUPPLY COMPANY, LIMITED, MONTREAL

manager, lines East, was effective in November, 1925, and he has held that position since that time. His first ODT assignment involves supervision and co-ordination of the field forces of the Division of Railway Transport.

Mr. Hayes joined the ODT staff in April, 1942, and until receiving his present appointment was in the office of information of that agency, working in the capacity of information specialist covering its railway functions.

Mr. Hayes was born January 27, 1897, in Muncie, Ind., and attended public schools at points where his father's railroad work took him. As a youth he learned telegraphy in the Pennsylvania office at Greenville, Ohio, and in 1913 he entered railroad work as a telegrapher on the Lake Erie & Western. In 1915 he secured a position as telegrapher on the Chicago division of the "Big Four," and in the next

O. W. I. Photo

W. E. Hayes

six years he held a succession of office and operating jobs on this and other midwestern roads.

After working in yard clerical positions on the Chicago division, at the Indianapolis, Ind., terminal, and as a brakeman on the St. Louis division of the "Big Four," Mr. Hayes was with the Chicago, Rock Island & Pacific in 1917 and 1918 at the St. Louis, Mo., yard. In the latter year he went with the Chicago, Indianapolis & Louisville, where he was attached to the Chicago office as a freight claim investigator.

In 1920 Mr. Hayes left railroad work, and from 1921 through 1928 he was engaged in writing on transportation subjects for the Associated Press and the Hearst newspapers. In 1927 he became news editor of the New York Evening Journal. In 1929 he was made editor of Railroad Magazine, which was revived under his direction by the Frank A. Munsey Company, in which position he continued until, in 1931, he resigned to devote his full time to free lance magazine writing on railroad and related subjects.

Fiction based on railroad operating backgrounds and fact articles on streamliners, c. t. c. and other developments of his authorship appeared in the Saturday Evening Post, Country Gentlemen, and other publications until, in 1942, Mr. Hayes joined the staff of the Office of Defense Transportation.

Navy Shipment Export Permits

Exemption from the port-traffic permit system is extended to shipments for export consigned to Navy supply officers or supply depots until January 15, 1943, the Office of Defense Transportation has announced, suspending, until that time, the effective date of its previous order, announced in *Railway Age* of December 26, page 1036, which required either regular ODT permits or special Navy Department permits of the so-called Series 66 for such freight after December 21.

WPB Has Enough Rail

As the War Production Board now has available all the rail it will need at present to meet demands of the military services, it has informed the Office of Defense Transportation that certification from that office as to the war transportation essentiality of railroad lines will not be required unless further demands are made upon it for rail. In making that information public, the ODT indicates that no action will be taken by it to certify whether or not lines are essential unless further WPB requests are received by it. Unless the WPB requisitioning program is revived rail abandonments will be authorized only through established I. C. C. procedures.

Manpower Commission Acts to Get More Track Laborers

Approval by the War Manpower Commission of proposals to import Mexican laborers to serve as track workers on southwestern railroads has been granted, it is reported, as part of a general program for the relief of labor shortages in that territory.

After agreements are worked out, it is said that men will be brought from other sections of the United States, as well as from Mexico, under plans designed to protect seniority rights, retirement benefits, and established working conditions, as well as to obtain from the employee some assurance of intention to accept steady employment, in which the Railroad Retirement Board, the federal employment service and other interested agencies will participate. It is expected that details of the program will be made public in the near future.

ODT Closes CWN Mail ng Office at Detroit

The Office of Defense Transportation's central mailing office at Detroit, Mich., has discontinued operations, and all matters pertaining to certificates of war necessity for motor trucks are now being handled by the regular ODT field force.

For the convenience of vehicle owners who do not live near any of the 142 district offices, the announcement stated, ODT is sending representatives into approximately 500 additional cities and towns throughout the country. They will make their headquarters in local chambers of commerce and other civic centers. Vehicle owners who have not received certificates or who have not been allotted sufficient mileage and fuel for their necessary operations are urged to get in touch with these field representatives immediately; for "after January 31, fuel, tires and parts will be allotted only on the basis of the conditions set forth on the certificate of war necessity, and no more temporary transport rations, under which many vehicles are now being operated, will be issued."

Eastman Urges Furniture Shows Be Cancelled

In a telegram sent December 24 to executives of several large furniture exhibits regularly held in January, and to individual furniture dealers and trade association officers, ODT Director Joseph B. Eastman appealed to them to cancel all sales shows and furniture marts.

"Last week," the telegram read, "it became necessary for me to reiterate and bring up to date my request to cancel conventions, sales gatherings, trade shows, etc. This request is based on recent traffic trends, including increasing military movements. It is now apparent that travel conservation must be accomplished wherever possible and palliatives such as mid-week travel and avoiding holidays will not suffice. Therefore, I find it necessary to advise all furniture marts and shows proposed or contemplated that travel which will be stimulated by holding such shows will interfere with essential travel and strongly urge that you cancel plans. This advice is up to date and reflects traffic developments during last 30 days and anticipated developments that we can now see for coming year. War Production Board furniture section in full accord with this request from production standpoint."

Following this announcement, it was stated that plans for some of the furniture shows would be carried out, however, as the message was interpreted as a request and not an order.

ODT Sees General Order No. 18 Off to Good Start

Initial reports on operation of the Office of Defense Transportation's General Order No. 18, establishing minimum limits for loading of carload freight, indicate that application of the order is resulting in "substantial savings of cars and motive power," said an ODT announcement of December 24. The reports show that in November, as compared with October, there were increases in average weight of loads per car for several commodities, ranging from 14 to over 22 per cent.

"ODT officials," according to the announcement, "said that if carload freight movements as a whole showed an increase in weight of loadings averaging as high as 15 per cent, there would be a resultant saving of possibly 75,000 freight cars weekly, with proportionate savings of motive power. The officials stressed the savings of motive power and the relief afforded

heavily taxed terminal facilities. They explained that the car savings, while important from the standpoint of conserving equipment, were secondary, since the car situation is not immediately critical."

Continuing, the announcement further quotes the "ODT officials" as saying that General Order 18 was issued "largely for the purpose of reinforcing" the favorable trend in the average tons per car of carload freight which in the second quarter of 1942 reached "a new high record of 40.6 tons." Also, it was intended to aid shippers in their efforts to cooperate on heavier loading by requiring competitors to conform to uniform shipping practices.

Byrnes Calls Rail Presidents to Petroleum Meeting

The critical petroleum supply situation in the states along the Atlantic seaboard was the subject of a meeting held in Washington, D. C., December 29 to which railroad executives were invited by Economic Stabilization Director James F. Byrnes. This meeting followed one with representatives of government agencies concerned with petroleum distribution held in Washington the previous week, at which it was reported that steps had been taken to improve the situation and that other moves are in progress. The conference at which railroad men were present was attended, in addition to Mr. Byrnes, by Price Administrator Henderson, Petroleum Administrator Ickes, and ODT Director Eastman. The railroads were represented by John J. Pelley, president of the Association of American Railroads, L. W. Baldwin, chief executive officer of the Missouri Pacific, J. M. Kurn, trustee of the St. Louis-San Francisco, J. L. Beven, president of the Illinois Central, E. E. Norris, president of the Southern, F. E. Williamson, president of the New York Central, and M. W. Clement, president of the Pennsylvania.

Locomotive Coal Prices Raised for Off-Line Roads

Because mines enjoy a greater margin of profit from sales to on-line railroads and to commercial accounts than to off-line roads, the latter have been experiencing difficulties in obtaining adequate supplies, the Office of Price Administration announced December 28, making public at the same time changes in maximum prices for coal which certain mines are permitted to charge off-line roads.

Many of these railroads have currently been using fuel from emergency stock piles, the statement continues, and are faced with the necessity of confiscating coal supplies consigned to other markets and transported over their lines. Some off-line roads are said already to have reported serious shortage.

Acting under the Bituminous Coal Act of 1937, the Department of Interior's bituminous coal division had fixed minimum prices for locomotive coal for off-line roads at 6 to 50 cents less per ton than for on-line roads in District 8—West Virginia, Kentucky, Virginia, Tennessee and North Carolina—and at 10 to 15 cents less in District 3—Northern West Virginia. The OPA order equalizes the prices for on-line and off-line roads on coal from mines in these districts.

Approximately 13,000,000 tons of coal for locomotive use is produced in District 8, according to the OPA announcement, and 40 per cent of this is normally shipped to off-line railroads. Approximately 60 per cent of the 8,000,000 tons of railroad coal mined in District 3 is shipped for off-line consumption.

The revised prices, the result of co-operation between the OPA and the bituminous coal division of the Interior Department, are covered by Amendment 32 to OPA Maximum Price Regulation No. 120.

Rail's 1942 Job Tops All Records

(Continued from page 141)

"9. Average daily movement of freight locomotives in 1942 was 122.5 miles, or an increase of 57 per cent compared with 1921.

"10. Tractive power of locomotives averaged 52,000 pounds, an increase of 40 per cent compared with twenty years ago.

"Never before have demands on the railroads been so great as in the past year. And never before has rail transportation played as important a part in the prosecution of a war as now. Immediately after Pearl Harbor, the railroads almost over night were called upon to move thousands of our armed forces from one coast to the other. These, complete with all equipment so as to be available for immediate field duty, were handled in scores of special trains. As the war program expanded, thousands of cars of materials of all kinds had to be transported to all parts of the country for the construction of defense plants. Later, as cars of raw materials were moved into those plants, others loaded with manufactured war materials were moved away from them and distributed throughout the country. With the increase in the number of armed forces, lend-lease shipments and war production as well as the freight traffic, which the cessation of intercoastal waterway operation caused to be diverted to the rails, the demands upon the railroads have continued to grow.

"Because of war activities in the Pacific, the volume of export freight moving to Pacific ports now approximates 30 per cent of the total handled through all ports compared with seven per cent in 1941. This has increased considerably the average length of haul. At the same time export freight traffic is moving into North Atlantic ports in a steady stream in contrast to the situation that prevailed on the Eastern seaboard in 1918.

"Despite the increased load placed on them, the railroads in the current year have continued successfully to meet not only the transportation demands growing out of the war but those required to meet civilian needs.

"Railroads in the first eleven months of 1942 installed in service 60,789 new freight cars and 668 new locomotives. Demand for materials needed for other war purposes, especially steel, has resulted in a reduction in the amount of materials allocated by the government for new railroad equipment. Otherwise, the number of new cars and locomotives put in service this year would have been greater. The supply of certain types of equipment, such as flat, gondola and hopper cars, has been at times barely adequate to take care of traffic demands. Additional equipment will be needed to enable the railroads to continue to meet transportation demands. Expectations are that greater war activity may result in an increase of about ten per cent in ton-miles in 1943 compared with 1942. The War Production Board has announced a program for part of the coming year which will enable the railroads to purchase 20,000 new freight cars and 386 new locomotives, including both steam and Diesels.

"Railroad taxes in the year ended with October 31, 1942, were by far the highest on record, amounting to the unprecedented sum of $1,077,000,000, or a daily average of nearly $3,000,000. In the calendar year 1941, their tax bill was $547,000,000. In order to meet their taxes alone, railway revenues derived from 56 days of operation were required in 1942, compared with 37 days in 1941.

"Expenditures for fuel, supplies and materials used in current operation by the Class I railroads amounted to approximately $1,400,000,000 in the calendar year 1942, compared with $1,161,000,000 in 1941.

"Capital expenditures in 1942 for equipment, roadway and structures and other improvements to property are estimated at $600,000,000 compared with $543,000,000 in the preceding year.

"Increased traffic as well as larger expenditures for maintenance work resulted in a further increase in employment on the railroads in 1942, the average number of employees having been 1,270,000, or an increase of 11.4 per cent compared with the preceding year. Annual earnings per employee in 1942 averaged $2,285, compared with $2,045 in 1941.

"Ability of the railroads to handle the record traffic this year has been made possible by the wholehearted cooperation of the shippers of the country; the sympathetic, and harmonious attitude of the Army and Navy; and the wise advice and directions of the Office of Defense Transportation. Through various organizations, shippers have concentrated on the prompt loading and unloading of freight cars and other means of improving the efficiency with which freight cars are being utilized by shippers and receivers of freight. The railroads appreciate the cooperation which they have received from private and public sources."

TRADE PUBLICATIONS

WHITING PRODUCTS.—A 24-page illustrated book (No. 236) entitled Whiting Products for Industry, has been published by the Whiting Corporation, Harvey, Ill., which gives a comprehensive picture of Whiting's service to industry, with condensed, but pertinent facts regarding its varied products, including cranes, railroad equipment, cupolas and foundry equipment. Swenson evaporators and filters, and other special Whiting equipment for heavy industries. The book is attractively printed in color and well illustrated with many photographs of the various types of equipment and of Whiting plant facilities.

News Department continued on second left-hand page

INCREASE YOUR LOCOMOTIVE AVAILABILITY

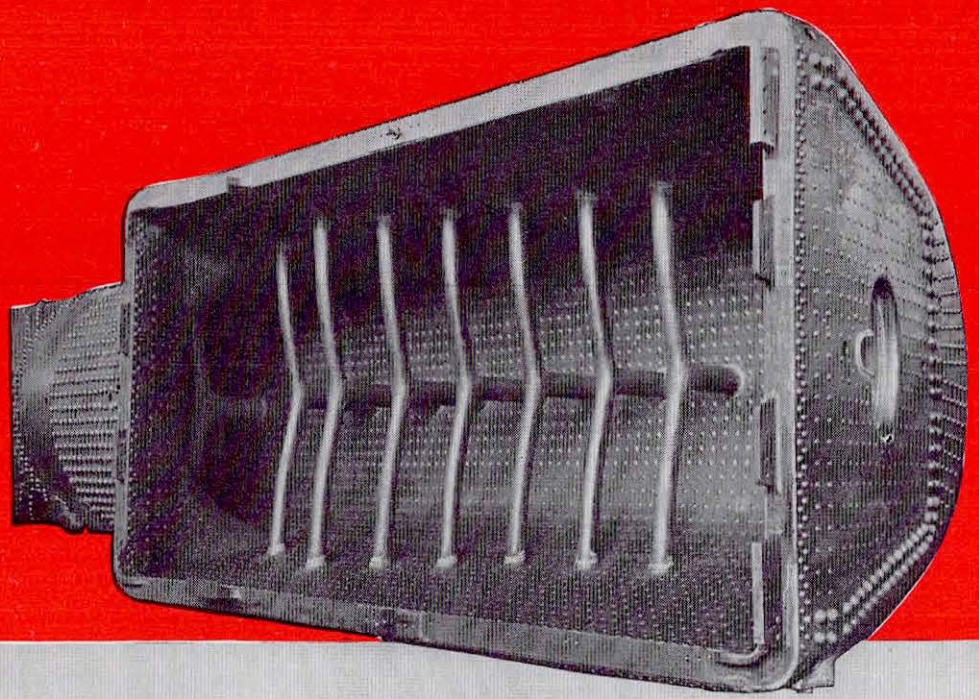
WITH

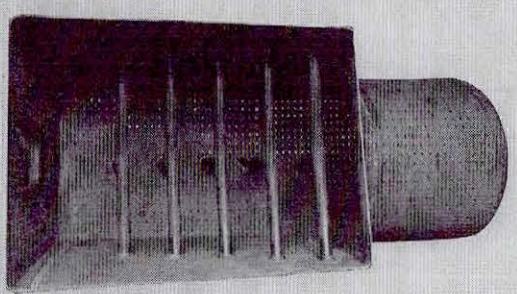
SECURITY CIRCULATORS

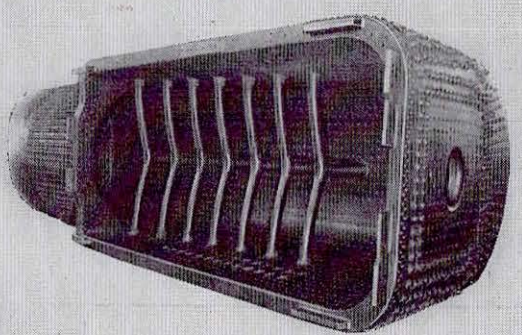
Applicable to all types of locomotives, Security Circulators provide increased locomotive availability through improved circulation in the side water legs, improved brick arch support, reduced honeycombing, flue plugging and cinder cutting.

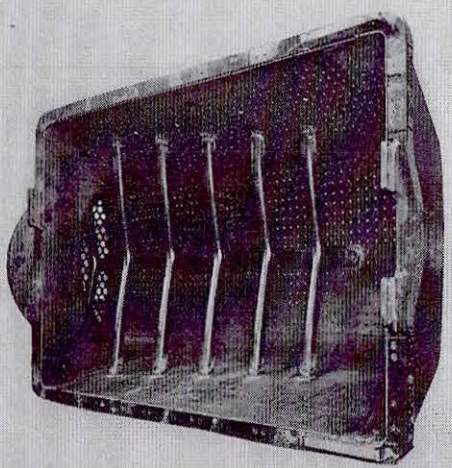
AMERICAN ARCH

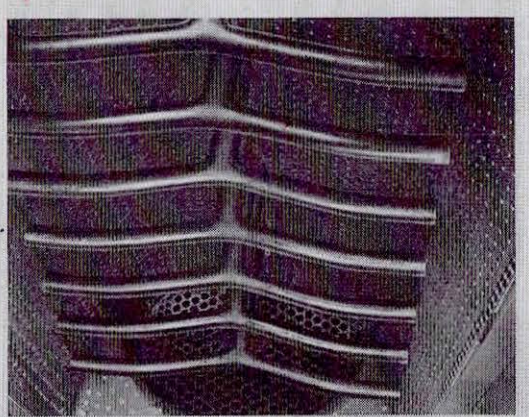
Security Circulator Division











Various types and sizes of fireboxes showing typical applications of Security Circulators

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GENERAL NEWS

Post-War Air Lines Won't Need Bounty

ea thinks legislation can now be based on industry's "economic service"

Promotional phases of government policy with respect to civil aviation will diminish as the industry emerges from the war in a stage of development which will permit future legislation to be based "more completely on its economic service," according to Chairman Lea of the House committee on interstate and foreign commerce. Mr. Lea expressed this view in a statement which appeared in the December 26 issue of the Congressional Record

The statement reviewed various Congressional actions which culminated in enactment of the Civil Aeronautics Act of 1938, and went on to list some 16 proposals, "which appear to merit consideration" in a study of future legislation for the industry. Such a study, Mr. Lea revealed, will be continued at public hearings expected to be conducted "in the early part of the year" by the interstate commerce committee's "permanent sub-committee on aviation."

The sub-committee, which is headed by Representative Bulwinkle, Democrat of North Carolina, is already convinced "that careful consideration must be given to proposed amendments to the Civil Aeronautics Act, particularly with respect to commercial operations."

In the latter connection Mr. Lea expressed the view that the set-up under the Civil Aeronautics Act has been "in harmony with the purpose to increase the efficiency of our transportation system as a whole." Nevertheless he thinks that the provisions of that act "may now well be examined in the light of the experience of the last four years and in anticipation of the approach of problems which can better be provided for in advance rather than wait until their solution will be made more difficult by practices and conditions which will surely develop in the meantime. Also, he took occasion to point out that the recent adoption of legislation providing for Interstate Commerce Commission regulation of freight forwarders was in line with "a determined purpose to lift federal regulation out of the evils of specialized favoritism, of multiplied, divided, and conflicting controls."

"Our policy," Mr. Lea continued, "has been to unify regulation from the legislative standpoint; coordinate the different transportation agencies of the country with a view of doing justice to each as between other agencies; with the final purpose of giving to each of such agencies, so far as practicable, that class of traffic it is best qualified to perform for the benefit of the country. In other words, the plans look toward unification of legislative control, coordination of agencies in the interest of giving the public better service and protecting each agency in that service for which it is best qualified.

"In dealing with aviation, Congress has recognized it as part of the transportation system of the country and has a policy harmonizing it with general transportation legislation through common committee and legislative control. That policy seeks to banish favoritism to any one class of carriers and give equally fair treatment to all types of transportation, based upon their service to the public.

"The needs of civil aviation, as a new and rapidly developing industry and which has been so dependent on encouragement and promotion, was given a separate regulatory body on account of those promotion features. As the airplane advances it can be based more completely on its economic service; its promotional phases will diminish and its transportation importance increase."

Among Mr. Lea's 16 proposals were those asking if regulation of air transport should be extended to contract carriers; if there should be provisions requiring air carriers to obtain certificates of convenience and necessity; if federal incorporation of air carriers would be desirable; if there should be "a more coherent and stable long-range program of airport construction;" and if regulation of rates for foreign air transportation should be extended.

New York-Washington and New York-Philadelphia Fares

The Interstate Commerce Commission has modified Ex Parte 148's rule for the disposition of fractions to authorize the Baltimore & Ohio, Pennsylvania, Reading and Central of New Jersey to adjust their New York-Washington and New York-Philadelphia fares so that they will end in 0 or 5. The adjustments will involve making the one-way first class fare between New York and Washington one cent less than it would be under the unmodified rule; while between New York and Philadelphia, the one-way first-class fare will be two cents less and the one-way coach fare two cents more.

The railroads' proposal in this connection was noted in the *Railway Age* of December 5, 1942, page 940. They sought the modification because the collection of fares which did not end in 0 or 5 would "tend to intensify the congestion at ticket offices at Washington, New York, and Philadelphia, and put a greater burden upon conductors in the collection of cash fares."

I.C.C.'s Monon Plan Cuts Fixed Charges

Provision is made to continue joint stock control by L. & N. and Southern

No provision is made for holders of secured notes and claims or of the preferred and common stock of the Chicago, Indianapolis & Louisville in the proposed plan for reorganization of that road submitted to the Interstate Commerce Commission by Examiner Milo H. Brinkley. Annual fixed charges would be reduced by the plan from $1,513,028 to $162,547. Total capitalization of the new company would be $30,079,094, as compared with $45,344,943 for the old.

Pointing out that the cost of reproduction less depreciation plus the value of lands and rights and the amount of working capital required for carrier purposes amounted in 1941 to $32,171,860, the examiner reports that capitalization at 4½ per cent of the 1940 earnings—which he regards as a good indication of the maximum average earnings in the future—would produce $30,032,000, or approximately the figure proposed for the new capitalization.

This figure was arrived at, the report indicates, by considering the 1940 earnings in comparison with the much smaller net earnings in the 10 preceding years, the actual 1941 earnings available for interest of $2,296,000, and the prospective large earnings of the immediate war years.

Under the proposed plan two classes of bonds and two classes of stock would be issued, representing all of the capitalization of the new company except equipment obligations. Both classes of bonds would be contingent interest issues, one of $8,736,209 to be a first mortgage bearing a 4½ per cent rate and the other, of $7,856,949, to be a second mortgage at 4½ per cent. Non-voting Class A common stock, preferred only in liquidation up to its par value of $25 per share, would be issued in the amount of $8,440,326, while Class B common stock, of no par value but stated at $20 per share, would amount to $4,975,610.

Fixed charges of $162,547 provided for under the examiner's plan would, in his opinion, be within reasonable limits, as the average available for such purposes in the years 1930 to 1941, inclusive, was $537,262 a year, but he is of the opinion that a further increase in such charges should not be made except to cover interest on future equipment obligations. The sum allocated to fixed charges would be distributed between the Chicago & Western Indiana sinking fund, requiring $109,200 annually,

(*Continued on page 147*)

News Department continued on next left-hand page

German Railroads Vulnerable

Strip Norway of Rolling Stock

Don't let it happen here

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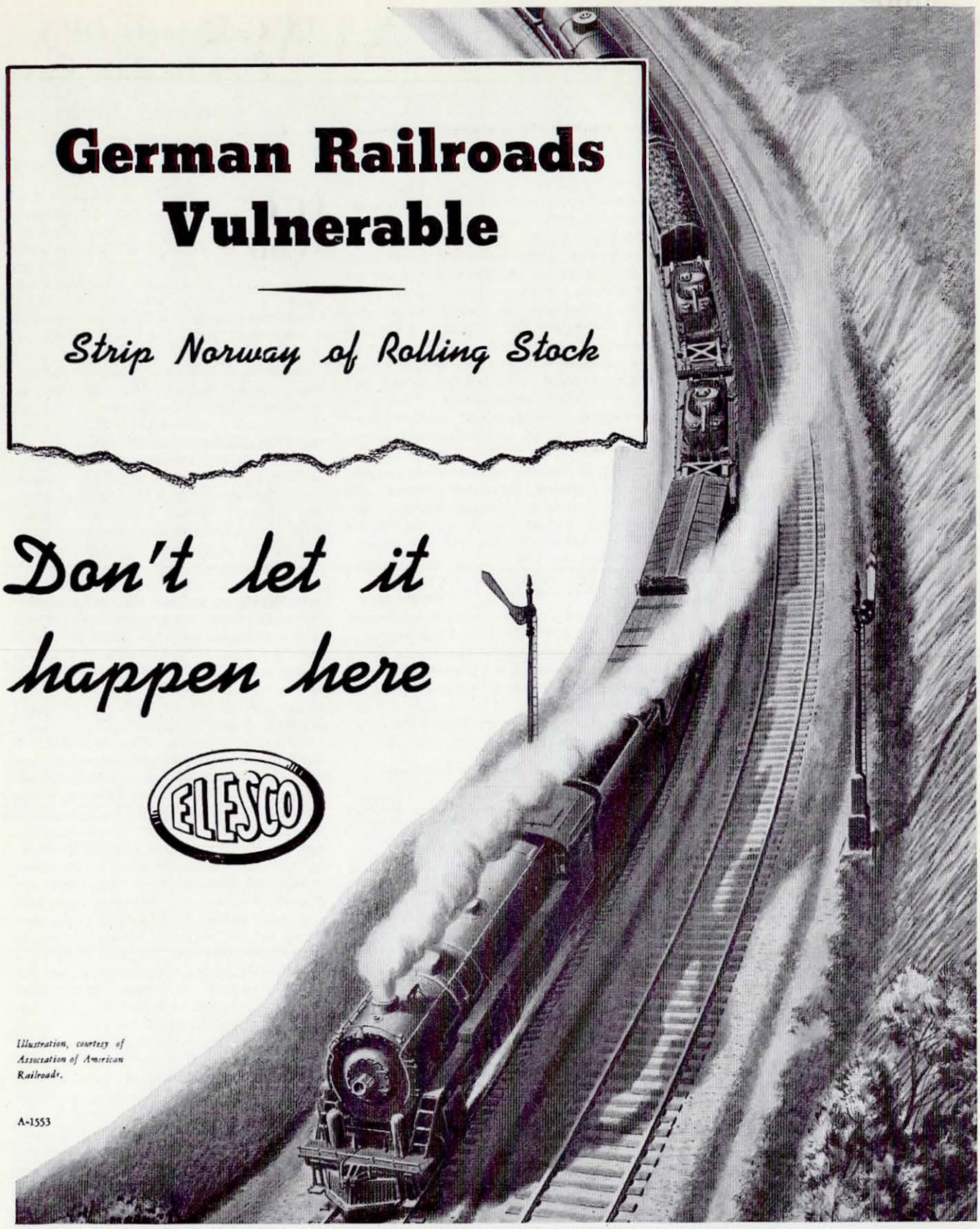

Illustration, courtesy of Association of American Railroads.

A-1553

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Conductor Awarded A Medal of Honor

Is acclaimed for risking his own life to save that of another

An Illinois Central conductor, Hollis W. Wortham of Louisville, Ky., has been awarded a medal of honor by President Roosevelt upon recommendation of the Committee on Award of Medals of Honor, approved by the Interstate Commerce Commission, under the 1905 law which provides for such medals for outstanding feats of bravery in connection with saving life upon railroads.

The act which brought this award is described in a commission notice as occurring February 27, 1942, within the limits of the government reservation at Fort Knox, Ky. An Illinois Central switching locomotive was engaged in pushing seven box cars eastward on a curve toward the reservation warehouses. A brakeman was riding on the front of the leading car, another brakeman was on top of the following car, and another brakeman was stationed at a nearby street crossing, while Mr. Wortham was on the platform of a warehouse some 275 ft. east of the point where the rescue took place.

As the moving cars rounded the curve and were about to enter straight track, the brakeman riding the leading car observed G. Douglass Carter, a deaf mute, walking eastward in the center of the track on which the movement was being made with his back toward the approaching cars.

Because of his impaired hearing, Mr. Carter did not hear the approaching cars or the warnings shouted to him by the brakeman. Mr. Wortham also called to Mr. Carter, but as his warnings were not heeded, he ran to the man and attempted to force him from the track. Not understanding the conductor's purpose, Mr. Carter resisted the attempt to rescue him. While the men were struggling in the path of the moving cars a corner of the leading car struck Mr. Wortham with such force as to throw both men to the ground clear of the track. Neither man was injured.

The locomotive and cars were moving at a speed of five to ten miles per hour, and the leading car was about 15 feet from Mr. Carter when the conductor reached him. The train was not stopped until after the leading car had passed over the point where the men had been struggling.

The medal awarded Mr. Wortham was the forty-eighth bestowed for acts of bravery of this character since the enactment of the Medals of Honor Act in 1905.

November Truck Freight Volume 6.2 Per Cent Under October

Freight transported by motor carriers in November dropped 6.2 per cent under the volume moved in October, but held 23.1 per cent over November, 1941, according to American Trucking Associations.

Comparable reports were received by A. T. A. from 202 motor carriers in 42 states. The reporting carriers transported an aggregate of 1,470,885 tons in November, as against 1,568,380 tons in October, and 1,195,160 tons in November, 1941. The A. T. A. index figure, based on the average monthly tonnage of the reporting carriers for the 1938-1940 period as 100, was 176.94. The index for October was 185.91.

Slightly less than 83½ per cent of all tonnage transported in the month was reported by carriers of general freight. The volume in this category decreased 7.1 under October, but increased 17 per cent over November of last year. Transporters of petroleum products, accounting for 13½ per cent of the total tonnage reported, showed an increase of 1.8 per cent over October, and a remarkable increase of 98.7 per cent over November, 1941. Haulers of iron and steel products reported slightly less than one per cent of the total tonnage; their volume showed a decrease of 7.4 per cent under October, and a decrease of 8.3 per cent under November, 1941. A little more than two per cent of the total tonnage reported was miscellaneous commodities, including tobacco, milk, textile products, coke, bricks, building materials, cement and household goods. Tonnage in this class showed a decrease of 16.3 per cent under October, but held 0.7 per cent over November of last year.

Freight Car Loading

Loading of revenue freight for the week ended December 19 totaled 742,911 cars. This was a decrease of 55,957 cars below the corresponding week in 1941, but an increase of 45,156 cars as compared with the same week in 1940. The summary for the December 19 week as compiled by the Car Service Division, A. A. R. follows:

Revenue Freight Car Loadings

For the Week Ended Saturday, December 19

District	1942	1941	1940
Eastern	140,436	168,713	156,259
Allegheny	156,248	174,324	154,379
Pocahontas ...	52,169	52,294	44,417
Southern	117,069	125,599	109,010
Northwestern...	82,548	96,815	81,434
Central Western	121,858	119,658	103,884
Southwestern ..	72,583	61,465	48,372
Total Western Districts	276,989	277,938	233,690
Total All Roads.	742,911	798,868	697,755
Commodities:			
Grain and grain products	47,565	41,431	27,933
Livestock	15,661	14,550	12,032
Coal	163,525	156,231	148,580
Coke	14,764	14,017	12,686
Forest products	41,496	43,170	37,454
Ore	13,855	13,752	13,046
Merchandise l.c.l.	87,147	150,066	148,953
Miscellaneous .	358,898	365,651	297,071
Dec. 19	742,911	798,868	697,755
Dec. 12	740,336	807,225	736,340
Dec. 5	759,621	833,375	738,513
Nov. 28	743,533	866,180	728,525
Nov. 21	836,427	799,386	733,488
Cumulative Total, 51 Weeks ..	42,227,144	41,683,262	35,812,547

In Canada.—Car loadings for the week ended December 19 totaled 65,169 as compared with 61,760 for the same week last year, according to the compilation of the Dominion Bureau of Statistics.

Total for Canada:	Total Cars Loaded	Total Cars Rec'd from Connections
Dec. 19, 1942	65,169	33,946
Dec. 12, 1942	66,724	34,548
Dec. 5, 1942	66,885	32,720
Dec. 20, 1941	61,760	32,491
Cumulative Totals for Canada:		
Dec. 19, 1942	3,326,507	1,727,415
Dec. 20, 1941	3,144,450	1,531,752
Dec. 21, 1940	2,772,239	1,273,777

I.C.C. Rejects OPA Plea in Rate Case

Gives opinion in Texas case that 6 per cent return is not too generous

Indicating its view that wartime railroad earnings of around six per cent on book investment are not out of line when appraised in the light of the lean pre-war decade and the wear and tear of current traffic on rail facilities, the Interstate Commerce Commission has ordered Texas roads to apply the Ex Parte 148 increases to intrastate rates and fares, thereby rejecting a petition of the Office of Price Administration which opposed the adjustment. The report in No. 28846 was by Chairman-elect Alldredge who spoke for an unanimous commission, although Commissioner Splawn did not participate; it was immediately interpreted by many observers as a preview of what the commission might finally do with respect to pending petitions wherein OPA, the Department of Agriculture, and others are seeking to have all the Ex Parte 148 increases rescinded.

Among other general observations, the commission said that the "inflationary" factor was "carefully weighed and reflected in the increases which we authorized under Ex Parte 148." Those increases, it added, "were graded all the way from nothing at all through three per cent and six per cent on freight to 10 per cent on passenger traffic."

"Our report in Ex Parte No. 148," it went on, "reveals that with respect to iron ore, coal and coke, after taking notice, among other things, of the effect upon the national defense of cumulative increases in production costs of manufactured products and the use of fuel as a primary necessity of life, we concluded that no increases should be allowed upon iron ore, not ground, and that the increases upon coal and coke should be less than those proposed by the carriers. With respect to agricultural products we said that to a considerable extent the amount of any increases allowed on other commodities would be reflected in higher prices of materials and supplies consumed on the farms and ranches; that the consumer of food would be better off if food be cheap; that advances in the prices of foodstuffs as major elements in the cost of living afford a predicate for renewed demands for higher wages in transportation and other industries; that it is in the interest of the carriers and of the general public that the cost of food shall not be permitted to advance any more than necessary; and that considering all these factors and others involved it seemed just and reasonable to permit the going rates on agricultural products and livestock to be increased by a lesser percentage than those on non-basic commodities generally."

Previously the commission had recalled that at the Ex Parte 148 hearings the Price Administrator "did not offer any evidence and did not oppose the increases there sought by the carriers but after our

decision in that proceeding he filed a petition seeking a suspension of the approved increases," which petition was denied. It went on to point out that the Emergency Price Control Act, as amended October 2, 1942, made "no change in the jurisdiction of the established agencies charged with the regulation of the rates, fares, and charges of common carriers and other public utilities"; although the amendment did contain that provision stipulating that no common carrier or utility could make any general increase in its September 15, 1942, rates without first giving 30 days' notice to the President and consenting to the intervention before the appropriate regulatory body of such agency as the President might designate.

OPA has been made the official interventionist; but the commission insists that the provision authorizing such intervention makes no changes in Interstate Commerce Act provisions relative to transportation rates and charges. It points out that no one has ever contended that the act was modified by the similar provision in the Agricultural Adjustment Act of 1935 and the Bituminous Coal Act of 1937, "authorizing the Secretary of Agriculture and the Bituminous Coal Commission to file complaints with us with respect to the rates on farm products and coal, respectively, and providing that before hearing or disposing of any complaint filed by any person other than the Secretary of Agriculture concerning rates on farm products, or the Bituminous Coal Commission with respect to rates on coal, we shall notify those respective agencies and upon their application shall permit them to appear and be heard."

The implication that the commission does not consider wartime earnings of six per cent out of line came in its discussion of the financial situation of the Texas roads. There the report said:

"The recent increase in the carriers' rates of return as shown by the appendix, for example 6.21 per cent on operations in Texas in May 1942, are the result primarily of the increased traffic due to the present emergency. It follows the lean period of 1931-1941, when the rates of return on the carriers' interstate and intrastate operations in Texas ranged from 0.57 per cent to 3.36, and averaged only 1.56 per cent, with an operating ratio ranging from 71 to 81, and averaging 77 per cent. The 3.36 per cent return in 1941 reflects a net railway operating income of about $30,000,000. The corresponding net railway operating income for 1942, based on the first five months of that year, is estimated at $50,000,000, which is equivalent to a return of 5.6 per cent. Applying the Ex Parte No. 148 increases to the intrastate operations in Texas would increase this return to about six per cent. These returns are based on book investment, the rate-making value not being shown of record.

"At least 50 per cent of the total volume of tonnage now being handled by the southwestern rail carriers and the Texas carriers in particular, consists of materials used in the war effort. Besides the constant increase in the volume of war traffic, the complexion of the remaining traffic is undergoing a constant change, due in part to embargoes against grain shipments and in part to the greatly restricted movement of automobiles, refrigerators, radios, and other civilian traffic.

"The increased use of railroad facilities due to the war effort necessarily entails a corresponding increase in plant depreciation resulting from the added wear and tear consequent thereupon. Because of the existing circumstances and conditions arising out of the war economy, it is impossible for the railroads to obtain the labor and materials necessary to the adequate maintenance and preservation of their properties. Accordingly, effective July 1, 1942, we have authorized the carriers at their option to accrue in their accounts deferred maintenance so long as the money is set aside as an actual cash reserve. Obviously, to the extent that any deterioration or depletion of respondents' properties in Texas was not taken care of in their operating expenses during the preceding six months, the rate of return on their Texas operations for the first half of 1942 may be somewhat overstated."

Involved in the decision were all Ex Parte 148 increases on Texas intrastate freight traffic, and the 10 per cent fare increase insofar as it applies to intrastate first-class fares, bringing them up to 3.3 cents per mile. The Texas commission had allowed the fare increase subject to the three-cents-per-mile maximum provided in Texas law, but the I.C.C. had a precedent for overriding this Texas law, i.e., the 1920 decision wherein it ordered Texas intrastate fares to be increased to 3.6 cents per mile. In ordering that the intrastate rates be brought into line with the interstate adjustment the commission found that a failure to do so would result in unjust discrimination against interstate commerce and undue preference of intrastate commerce.

Morse Says Vacation Agreements Not a "Make Work" Plan

In the full text of his award in the controversy between the railroads and fourteen non-operating unions involving interpretations and applications of the vacation agreement of December 17, 1941, the referee, Wayne L. Morse of the National War Labor Board, has commented critically upon the attitude, as he understood it, of counsel of both parties in the dispute.

It was his impression, says Mr. Morse of the hearings in Chicago, July 30 and August 1 and 2, which were reported in *Railway Age* of August 8, page 234, "that both sides of this dispute seemed to have lost sight of the primary purpose of the vacation agreement; namely, to give a vacation with pay each year to the employees involved in the dispute. It certainly was not the intention of the parties originally to make it as difficult as possible for employees to get a vacation, nor was it their intention to make the vacation grant as great a burden upon the carriers as possible."

Referring in another place to Article 4 of the agreement, which states that consideration shall be given employees' preferences when fixing vacation dates, consistent with requirements of service, Mr. Morse remarks that "it would appear that the carriers have been adamant in their contention that they should maintain final and complete managerial control over the granting of vacations. The employees, on the other hand, seem to have taken the position that their convenience, when it comes to granting vacations, should be the paramount consideration in applying Article 4. To a certain extent the impression is created by the record that if employees are unable to get their vacations during the summer months they feel that their rights under Article 4 have not been fully protected."

Calling for "mutual confidence" in administering the vacation system, the referee remarks that "there runs through the entire record of this case evidence that the employees, rightly, or wrongly, entertain the suspicion that some of the carriers, at least, seek to interpret and apply the vacation agreement in every way possible which will save money at the expense of the workers. . . . On the other hand, there is certainly plenty in the record of this case which shows that the representatives of the carriers suspect the representatives of the employees of advancing technical and strained interpretations of the contract in order to seek advantages for the employees not intended when the agreement was adopted. One cannot read the record as submitted by the carriers without recognizing that the carriers suspect the employees of using the vacation agreement to gain additional financial advantages for the employees over and above the paid vacations themselves.

"The vacation agreement," Mr. Morse adds, "was not designed to foster a make work" program or provide hidden wage increases, and it is respectfully suggested that the representatives of the employees should do everything in their power to remove from the minds of the representatives of the carriers the suspicion that any such motives lie back of the employees' proposals for administering the vacation agreement."

In all, 22 questions in dispute are discussed in the referee's report. Of these, four were settled by mutual agreement in the course of the proceedings. In six cases Mr. Morse has accepted substantially the employees' interpretations, while in seven cases he favors the interpretation of the railroads. In the other five cases he outlines in some detail decisions differing from the suggestions of both parties.

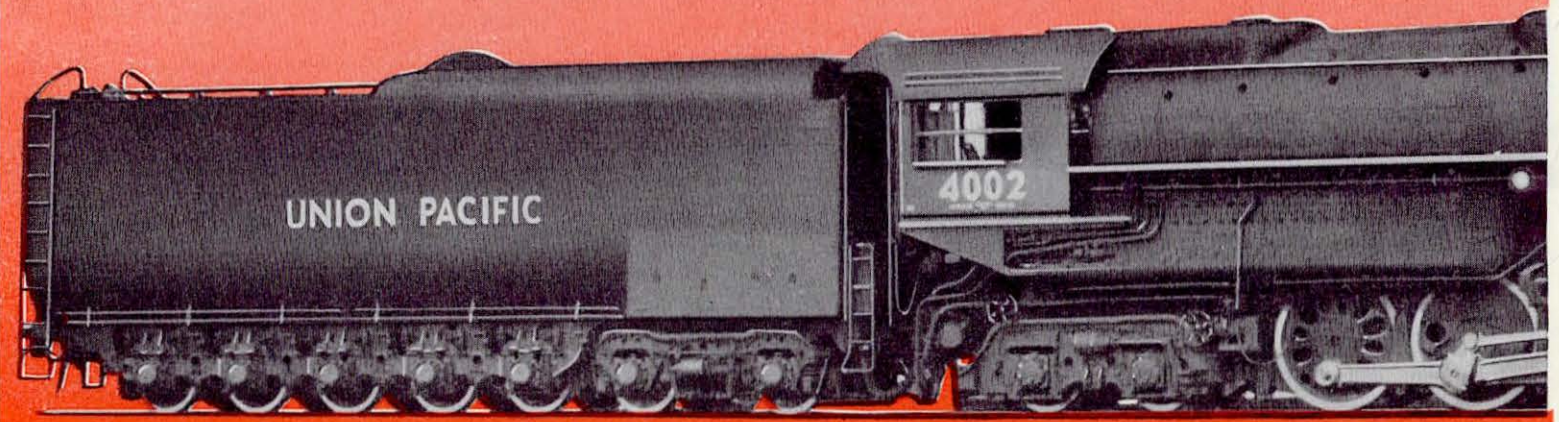
"Grandfather" Certificate Issued to Federal Barge Lines

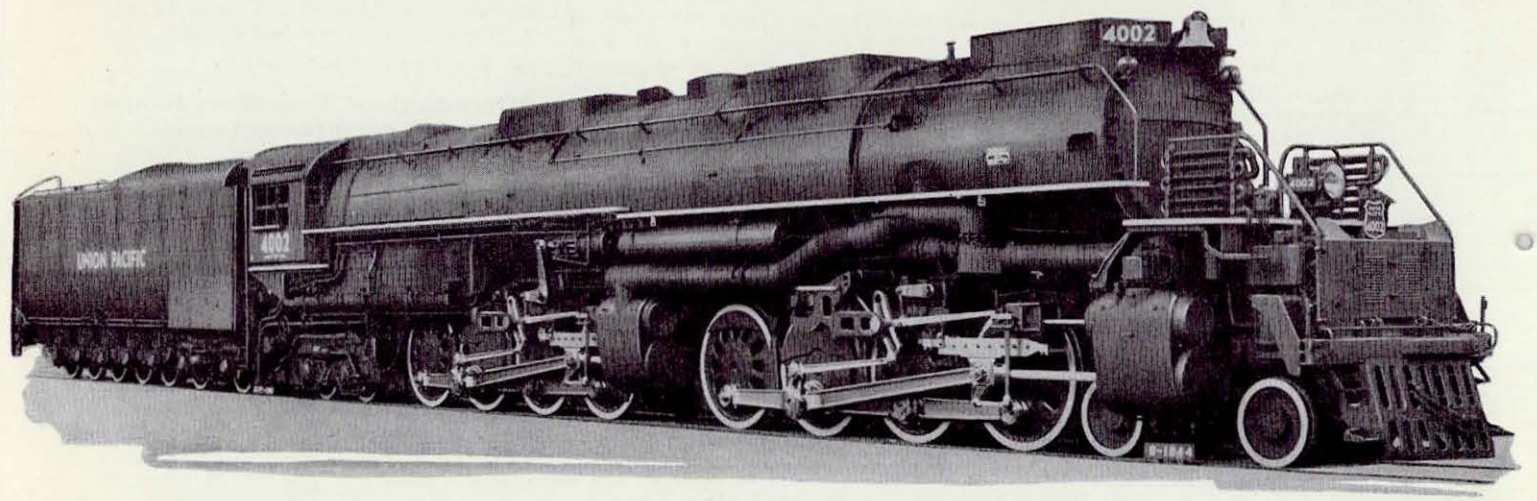
The government-owned Inland Waterways Corporation, operating the Federal Barge Lines, has been found by the Interstate Commerce Commission to be entitled to a "grandfather" certificate under Part III of the Interstate Commerce Act, authorizing continuance of its water carrier operations. The report by Division 4 is in No. W-381.

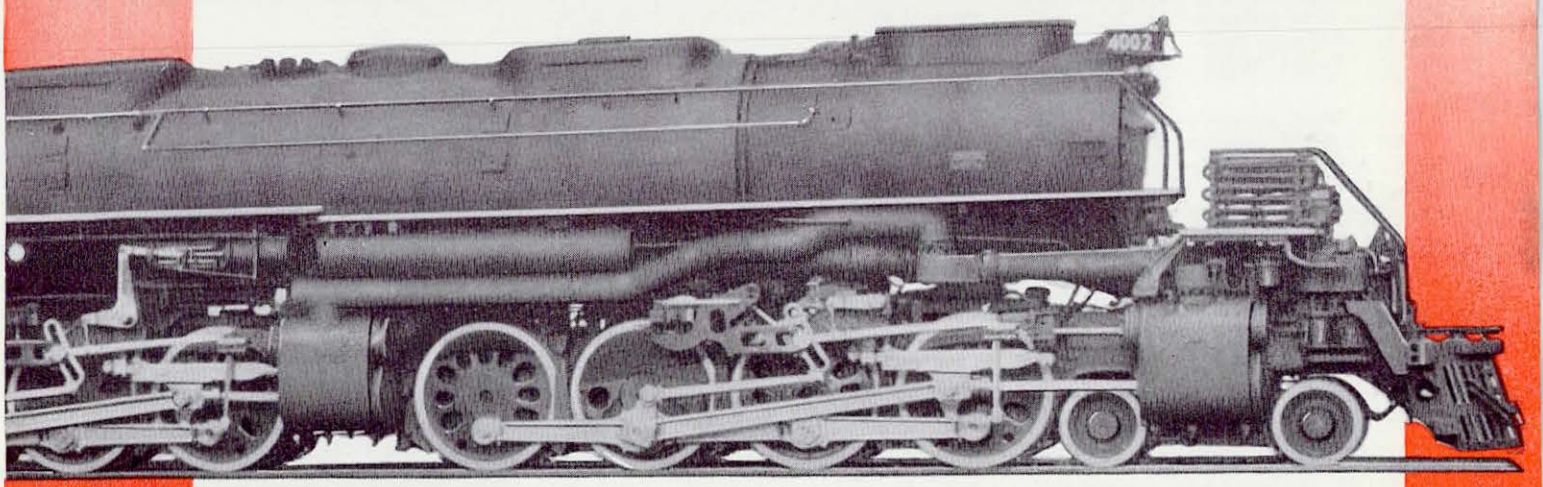
I. W. C. got all it asked, except authority to serve points on the Missouri river

News Department continued on second left-hand page

"BIG BOY"







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Locomotive Characteristics

Weight on Drivers	540,000 lb.
Weight of Engine	762,000 lb.
Cylinders (Four)	23¾ x 32 ins.
Diameter of Drivers	68 ins.
Boiler Pressure	300 lb.
Tender Capacity—Fuel	28 tons
Tender Capacity—Water	24,000 gals.
Tractive Power	135,375 lb.

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north of Kansas City, Mo., the commission concluding that the applicant was not there engaged in "bona fide operation" continuously since the January 1, 1940, "grandfather" date. The record, according to the report, showed that I. W. C. had not engaged in transportation north of Kansas City since 1935 when it handled three shipments of grain in bulk from Leavenworth, Kans., to Chicago.

Aside from this denial of the north-of-Kansas-City phase of the application, the commission's finding was that I. W. C. "was in bona fide operation on January 1, 1940, as a common carrier by water by non-self-propelled vessels with the use of separate towing vessels, in interstate or foreign commerce, in the transportation of commodities generally between ports and points along (1) the Mississippi river from Minneapolis to its mouth, including Cairo, (2) the St. Croix river from Stillwater to its confluence with the Mississippi river, (3) the Illinois Waterway, and Lake Michigan between Waukegan and Gary, inclusive, (4) the Missouri river from Kansas City, Kans., to its confluence with the Mississippi river, (5) the Gulf Intracoastal Waterway from the Mississippi river to Mobile, and (6) the Mobile, Tombigbee, Warrior and Black Warrior rivers, including the Locust and Mulberry forks of the Black Warrior river and Short creek, including the ports named, except as such operations have heretofore been authorized by the commission in certificates issued to applicant under the Inland Waterways Corporation Act."

In the latter connection the report explained that the applicant already had I. W. C. Act certificates for service to ports where it maintained or sought joint-rate arrangements with railroads; and Part III provided that such certificates shall continue in effect.

I.C.C.'s Monon Plan Cuts Fixed Charges

(*Continued from page 144*)

leased line rentals, amounting to $29,738, and $23,609 for interest on present equipment obligations and conditional sales contracts.

Contingent interest charges on the two issues of bonds proposed would total $724,852 annually. Sinking fund payments of $100,000 per year are provided for, and $210,000 annually is allocated for additions and betterments, bringing the total of charges before dividends to $1,197,399. The two classes of stock are to share equally in dividend appropriations, and the examiner points out that the income available for interest in 1941 would, after provision for the charges enumerated, have left available for dividends about $1.87 per share.

Under the plan holders of refunding mortgage bonds of the old company and Indianapolis & Louisville mortgage bonds would receive about 33.9 per cent of their claims in new first mortgage bonds, 31.85 per cent in second mortgage bonds, and 34.25 per cent in Class A stock. Public holders of the first and general 5 and 6 per cent mortgage bonds would receive about 3.23 per cent of their claims in first mortgage bonds, 1.42 per cent in second mortgage bonds, 1.52 per cent in Class A stock, and 22.62 per cent in Class B stock.

The Railroad Credit Corporation would receive about 5.96 per cent of its claim (amounting to $1,705,000) in first mortgage bonds, 2.61 per cent in second mortgage bonds, 2.8 per cent in Class A stock, and 41.7 per cent in Class B stock. The Chase National Bank of New York for its claim for $1,151,073 would be allocated 10.89 per cent of its claim in first mortgage bonds, 4.77 per cent in second mortgage bonds, 5.12 per cent in Class A stock, and 76.23 per cent in Class B stock.

In providing for limited fixed charges under the new plan, the examiner points out that the purchase of new equipment, particularly freight cars, is essential to continued efficient operation of the road. While he assumes that such equipment as can be manufactured under current conditions can readily be financed from cash on hand or earnings in the near future, substantial new equipment trust obligations will eventually be necessary in his opinion to meet the road's needs in this respect. Certain proposals of creditors for undertaking grade reduction programs and purchasing Diesel-electric locomotives the examiner would defer for later study.

In finding the preferred and common stock of the debtor company without value, the examiner recognizes that the Southern and Louisville & Nashville thereby would lose control of the property, yet he accepts the opinion of committees representing creditors that continuation of traffic interchange between these roads and the Monon is essential to the prosperity of the new company.

"The connections of the debtor," he points out, "are such that it is largely limited to dealing with the proprietary companies. The debtor handles essentially north and south traffic and is not in a position to handle any large amount of the highly competitive east and west traffic. It must have the support of strong connections at the Ohio river if it is to procure essential tonnage. The Louisville & Nashville and the Southern offer the strongest alliance the debtor can secure because their lines serve the entire South and neither has a line of its own into the territory of the debtor. The retention of an interest by the proprietary companies in the debtor's lines is vitally necessary to the prosperity of the debtor, although it is possible that the debtor could continue to exist without their aid, but with greatly reduced earnings." Strong representations were made by state officials and other interests representing southern opinion, he adds, that the relationship between these roads should be continued.

To effect continuation of this relationship under the plan of reorganization, the examiner proposes that a trust be formed to have custody over all of the new Class B stock. For a period of three years the trustees would have power to transfer 50 per cent of this stock to the Louisville & Nashville and Southern in exchange for a traffic agreement "and other considerations." Such an agreement has been approved by the two proprietary roads, subject to the proposed plan of reorganization becoming effective. Ownership of 50 per cent of Class B stock would constitute control of the reorganized company, the examiner says. The stock remaining in the hands of the trustees, and any other assets they may have, would then be distributed pro rata among all parties to whom shares of the Class B stock were allotted in the plan.

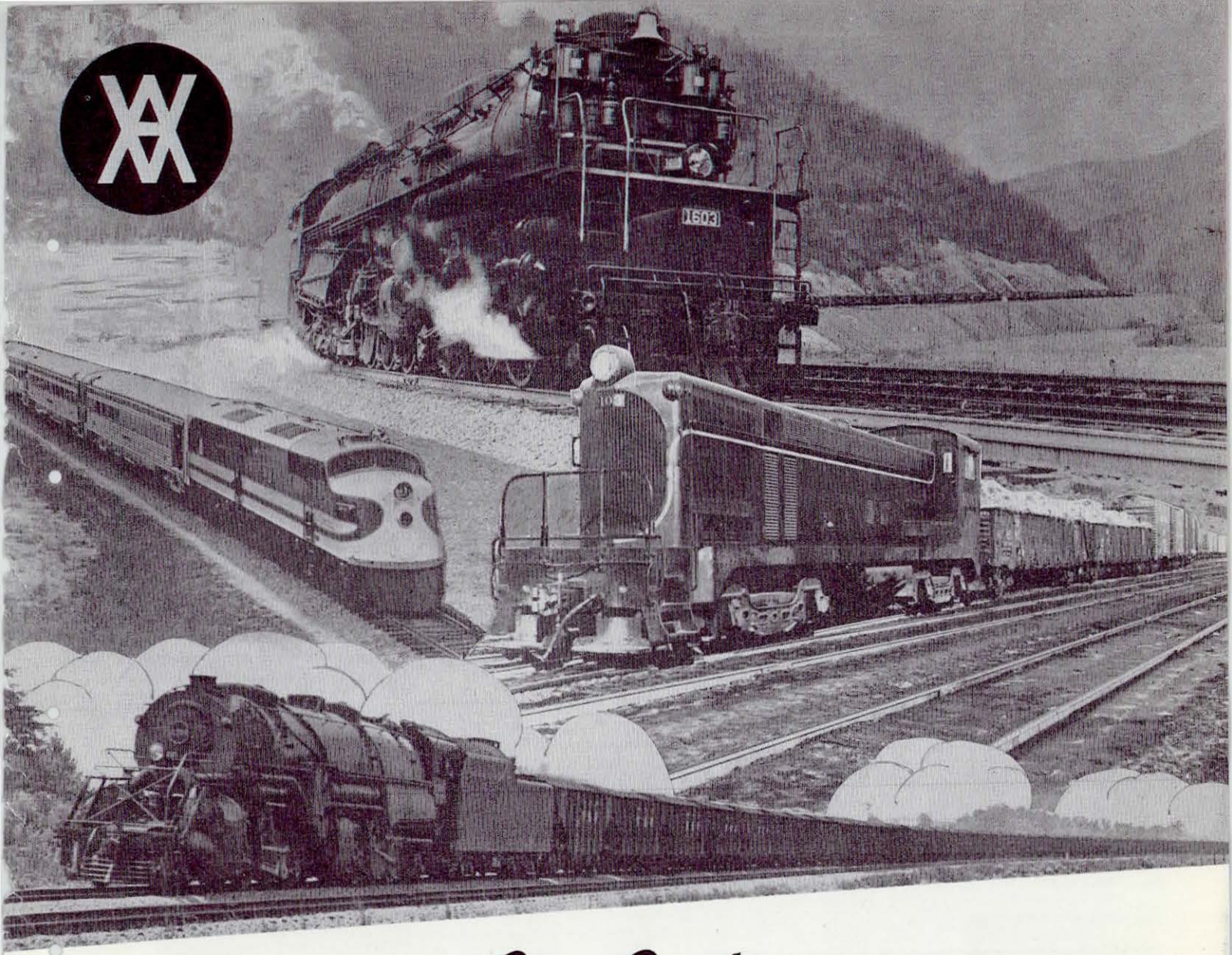
Accompanying the examiner's proposed plan is a notice to parties of record that exceptions to the report must be filed in Washington, D. C., and served so as to reach other counsel within 45 days from December 22, while replies to such exceptions must be filed not later than 10 days after the date when the exceptions are due.

Northwest Service Command Takes Over Routes to Alaska

The Northwest Service Command has been established by the Army to supervise and maintain supply routes to the Alaskan Area. Technical supervision of the White Pass & Yukon, a three-foot gage line which links the Alcan International Highway with the Inside Passage at Skagway is under the direction of Brigadier General Carl R. Gray, Jr., commander of the Military Railway Service with headquarters at St. Paul, Minn., while Major John E. Ausland is in charge of the Army operation of this railroad with headquarters at Skagway and Colonel John W. Wheeler is the engineer officer in charge of the Alcan International Highway recently completed from Dawson Creek, B. C., to Fairbanks, Alaska, a distance of 1,630 miles. His headquarters are at Whitehorse. Both

Col. Wheeler, Left, and Major Ausland, Right, Are Standing on the Platform of One of the Historic White Pass & Yukon Coaches Which Used to Carry Goldseekers into the Klondike

News Department continued on next left-hand page



MODERN *Air Brakes* help Secure the MOST from Available Facilities

Smooth train handling — higher operating speeds in safety — adequate control for heavy tonnage trains — maximum flexibility for quick terminal shifting — reliable performance under rigorous duty — durability for long time service. These advantages accruing from the use of modern air brakes, adapted for specific requirements on various types of equipment, are helping to expedite volume shipments of vital wartime materials and supplies ★ Moreover, they will be an accumulating asset for peacetime transportation as an increasing proportion of locomotives and cars become equipped with this up-to-date apparatus. Now the demand is for quantity, time-saving, and continuity. Then, operating economy may be a major requirement, and you'll need the most of the best.

WESTINGHOUSE AIR BRAKE CO.
Wilmerding, Penna.

Colonel Wheeler and Major Ausland are on leave from the Chicago, Burlington & Quincy. The former was executive assistant to the president and the latter was assistant engineer.

L. N. E. R.'s Middlesbrough Station Bombed

From the information agent of the London & North Eastern comes a story of the bombing of its Middlesbrough station which has just been released by the censors.

Bombs hit the station, smashing part of the buildings and cutting off the four through lines, at the same time causing considerable damage to a train which was standing in the station. The head-end of the locomotive was damaged, the car bodies torn and windows broken. The engineer and fireman of the train were injured and several other railway employees were killed.

Almost before the noise of the explosions and falling masonry had ceased, L. N. E. R. men and women were back on the job, some of them working for 33 hours without relief. Within 15 minutes of the end of the raid, buses had been lined up to supply shuttle service around the break in the line. Ten minutes later these buses were in operation. The public was informed of this alternate service through the use of loudspeakers mounted on vans supplied by the local information committee. A railway employee was sent on bicycle to put this information on L. N. E. R. bill boards in the town and suburbs. Arrangements were made for the delivery in Middlesbrough of newspapers, mail, milk, fish and other perishable traffic by highway direct from the Stockton station and war workers were taken directly to their destinations by buses.

Within an hour of the raid, 200 troops were hard at work helping L. N. E. R. employees to clear the debris away and restore the tracks. The damaged locomotive and cars were removed in a few hours and by early afternoon of the following day the freight lines were cleared for traffic. Passenger train service was resumed less than 48 hours after the raid.

Representation of Employees

The National Mediation Board has dismissed the application of the Utility Workers Organizing Committee (C. I. O.) for its intervention in a dispute as to representation of certain maintenance of way employees of the New York, New Haven & Hartford. Preliminary investigations had led the board to suggest to the union that it should modify or withdraw the application, but the suggestion was declined and a formal hearing was conducted November 5 before David J. Lewis, a member of the board.

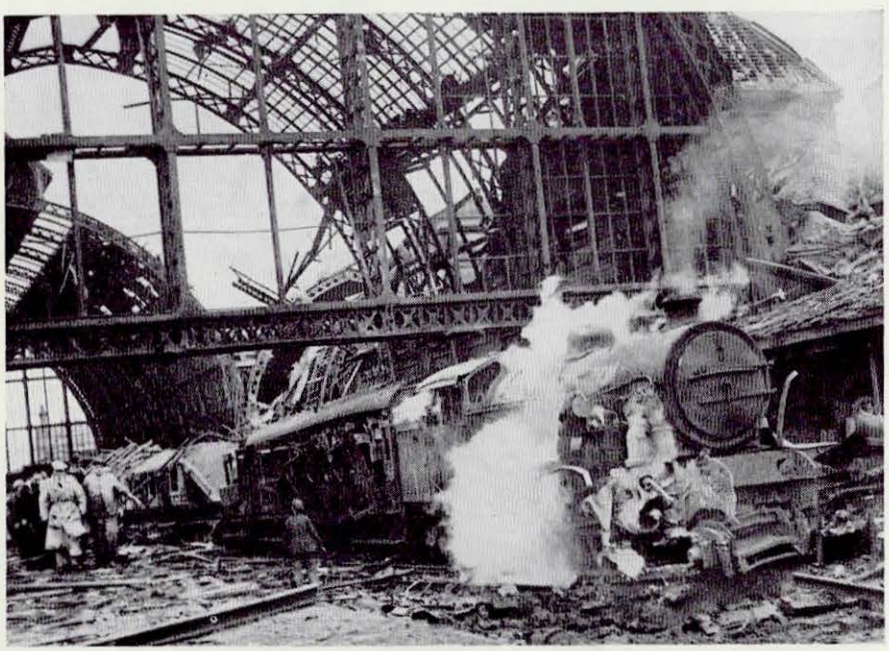
The employees involved were ditcher engineers and crane engineers, watchmen and firemen, altogether 37 out of a total of about 3,600 maintenance employees covered by an agreement between the railroad and the Brotherhood of Maintenance of Way Employees (A. F. of L.) The issue raised was whether these employees constitute a separate class or craft, under the Railway Labor Act, or whether they are only a part of the craft usually recognized as maintenance of way employees.

In its decision the board points out that it is not authorized by the law to originate crafts or classes of its own design. "It is implicit in the law," it states, "and it has so been held by the courts that crafts or classes are established by the employees by their own voluntary action." On virtually all railroads all maintenance of way employees are treated as a single craft, the board points out, as they are on the railroad involved, and in accordance with the Railway Labor Act the board "has consistently held that it does not have authority to issue certifications which comprehend only portions of established crafts or classes."

The majority rule principle, the ruling says, "is the essence of industrial democracy. But this principle must be applied within stabilized and well recognized groups of employees, if it is to help rather than hinder the employees. It cannot be used to obtain separate representation rights for small groups of disgruntled employees wherever they may be found. . . . Once the lines of well established crafts or classes are broken their complete disintegration would soon follow. Then, instead of stability in collective bargaining relationships in the railroad industry, there would be chaos."

On the Quanah, Acme & Pacific the appropriate unions operating through the A. F. of L. Railway Employees' Department were authorized to represent machinists, carmen (including coach cleaners), helpers and apprentices of these classes, power house employees and shop laborers. The Brotherhood of Locomotive Engineers was authorized to represent engineers, firemen and hostlers on the Cornwall, and the Brotherhood of Railroad Signalmen of America was designated to represent signalmen and telegraph linemen on the Louisiana & Arkansas. None of these employees had previously been represented by any organization, the board states.

Signalmen and telegraph linemen on the Kansas City Southern will be represented hereafter by the Brotherhood of Railway Signalmen of America as a result of a National Mediation Board order. These employees had been represented by the Order of Railroad Telegraphers, but that union relinquished its rights in that connection before the ruling was announced.



The Middlesbrough Station of the L. N. E. R. After the Raid

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

ALLIED RAILWAY SUPPLY ASSOCIATION.—J. F. Gettrust, P. O. Box 5522, Chicago, Ill.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—W. R. Curtis, G. M. & O. R. R., 105 W. Adams St., Chicago, Ill.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. P. Soebbing, Railway Exchange Bldg., St. Louis, Mo.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—B. D. Branch, C. R. R. of N. J., 143 Liberty St., New York, N. Y.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—F. O. Whiteman, Room 332, Dearborn Station, Chicago, Ill. Annual meeting, May 18-20, 1943, La Salle Hotel, Chicago, Ill.

AMERICAN ASSOCIATION OF RAILWAY ADVERTISING AGENTS.—E. A. Abbott, Poole Bros., Inc., 85 W. Harrison St., Chicago, Ill.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—F. R. Borger. C. I & L. Ry., 836 S. Federal St., Chicago, Ill.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—Miss Lorene Kindred, Room 822, 310 South Michigan Avenue, Chicago, Ill. Annual meeting, October 19-21, 1943, Chicago, Ill.

AMERICAN RAILWAY CAR INSTITUTE.—W. C. Tabbert, 19 Rector St., New York.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—H. C. Millman, Ind. Agent, Pennsylvania R. R., Union Station, Chicago, Ill.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—Works in cooperation with the Association of American Railroads, Engineering Division.—W. S. Lacher, 59 E. Van Buren St., Chicago, Ill.

AMERICAN RAILWAY MAGAZINE EDITORS' ASSOCIATION.—Page N. Price, Norfolk & Western Magazine, Roanoke, Va.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—J. H. Huntt, Tower Bldg., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—C. E. Davies, 29 W. 39th St., New York, N. Y.
Railroad Division—E. L. Woodward, *Railway Mechanical Engineer*, 105 West Adams St., Chicago, Ill.

News Department continued on fifth right-hand page

—from Our Commander-in-Chief

"With confidence in our armed forces, with the unbounding determination of our people, we will gain the inevitable triumph. So help us, God."

FRANKLIN D. ROOSEVELT

"I AM GLAD to give credit to the railroads of the country for the fine service which they have rendered since the emergency began. They have both planned and functioned well.

"Despite extraordinary difficulties, the carriers have performed magnificently. They have done all that has been required and done it well. The record is everlastingly to their credit."

JOSEPH B. EASTMAN

2700 h.p. GM Diesel Freight Locomotive approaching the summit of the Continental Divide near Butte, Montana.

GENERAL MOTORS LOCOMOTIVES

ELECTRO-MOTIVE DIVISION

GENERAL MOTORS CORPORATION — LA GRANGE, ILLINOIS, U.S.A.

TRANSPO

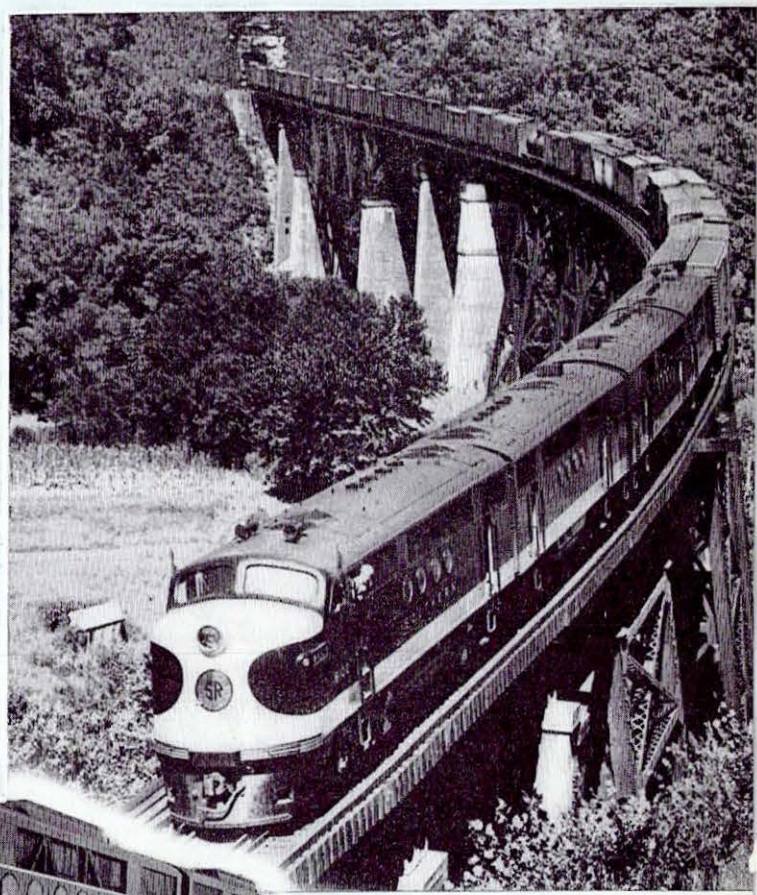
ALL FREIGHT RECORDS BROKEN IN 1942

AMERICAN Railroads, faced in 1942 with the greatest responsibility in our nation's history, have met the challenge by shattering all previous records in operating efficiency. These outstanding accomplishments include — all-time record freight traffic — all-time record locomotive mileage — record freight car mileage and all-time record equipment utilization. Never before have the railroads delivered so much freight transportation with so few locomotives and cars. And in the performance of this record-breaking job, the railroads have used virtually all of their reserves, and are pushing all available rolling stock, as well as all supporting equipment and facilities, to the very limit of their capabilities. Such performance must continue if we are to successfully meet the conditions which we are sure to face even after the war. Transportation is vital to Victory and

VICTORY IS OUR BUSINESS

GENERAL MOTORS
LOCOMOTIVES

RTATION

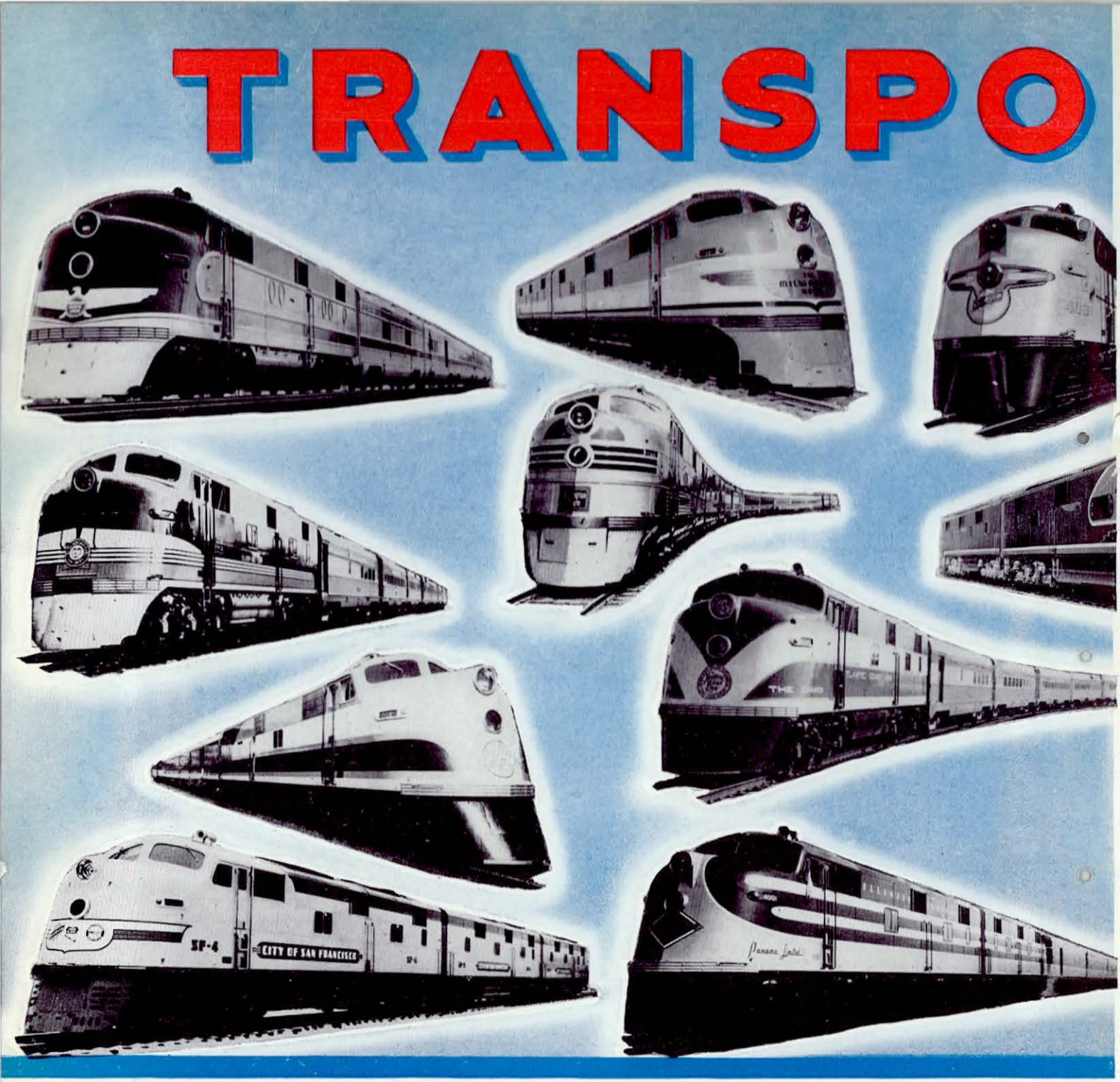


GM DIESELS MEET THE CHALLENGE

TO "Keep 'em Rolling" in 1943, railway motive power will have to keep step with the ever-increasing war-time traffic. To meet this demand, existing locomotives must be kept in maximum repair and new locomotives will be provided as authorized by the War Production Board. In the selection of new power, maximum performance and economy and minimum use of critical materials are of major importance. General Motors Diesel Road Locomotives make possible greater hauling capacity — reduction in train miles as much as 50 percent — faster schedules — greater availability — release for other important services as many as five heavy steam locomotives for each Diesel locomotive operated — increased carrying capacity of existing track facilities resulting in less wear and tear on rail and bridge structures. And in the *conservation of vital materials*, one ton of materials in a GM Diesel locomotive will do the work of more than two tons of materials in a steam locomotive.

THE AMERICAN WAY WILL WIN

GENERAL MOTORS
LOCOMOTIVES



GREATEST MOVEMENT OF MEN AND

EVERY minute — every hour — every day — millions of America's men and women on the fighting and home fronts are producing more and more for victory.

LET IT NEVER BE
"TOO LITTLE—

VICTORY IS OUR BUSINESS

GENERAL MOTORS
LOCOMOTIVES

RTATION

MATERIALS THE WORLD HAS EVER SEEN

WITHOUT an adequate transportation front, all this would be for naught. Fighting men cannot wait. Delay in getting equipment and supplies to our fighting forces may mean the difference between victory and defeat.

SAID OF AMERICA
—TOO LATE"

SERVING THE RAILROADS SERVES AMERICA

GENERAL MOTORS
LOCOMOTIVES

600 Hp. Switcher

Outstanding Time Savers...

NO BOTTLENECKS

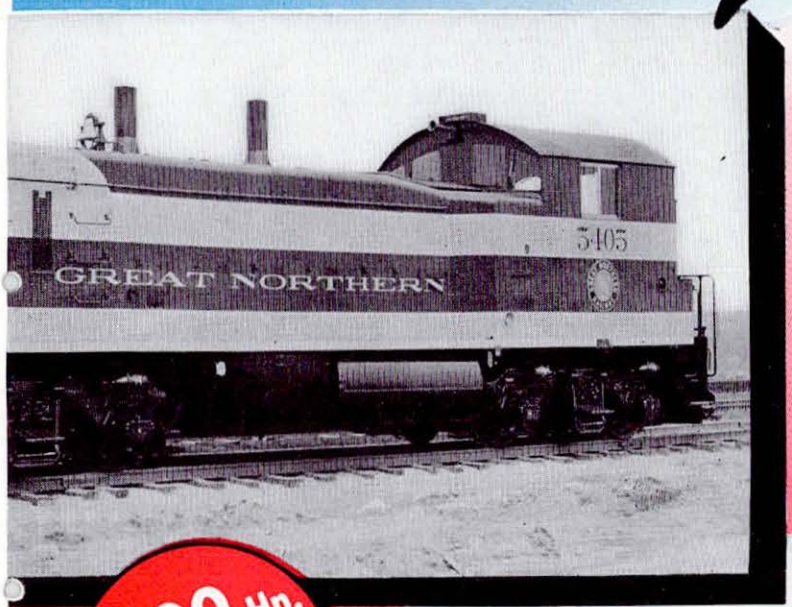
GM DIESEL locomotives in yard switching and heavy transfer service are providing outstanding economies, greater starting effort, high availability, superior flexibility, greater safety and more work output . . . This means more efficient service — faster deliveries — greater protection to lading . . . lower operating costs — fuel — servicing — repairs — and fewer locomotives required to meet the demands.

GM DIESELS—THE DEPENDABLE MOTIVE POWER

1000 Hp. Switcher

GM DIESEL SWITCHING and TRANSFER LOCOMOTIVES

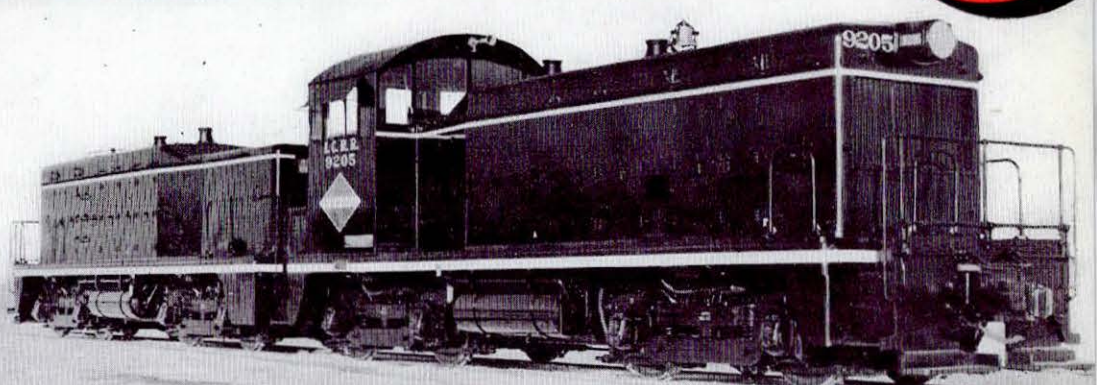
Provide Faster - Safer - More Dependable Yard Movements..

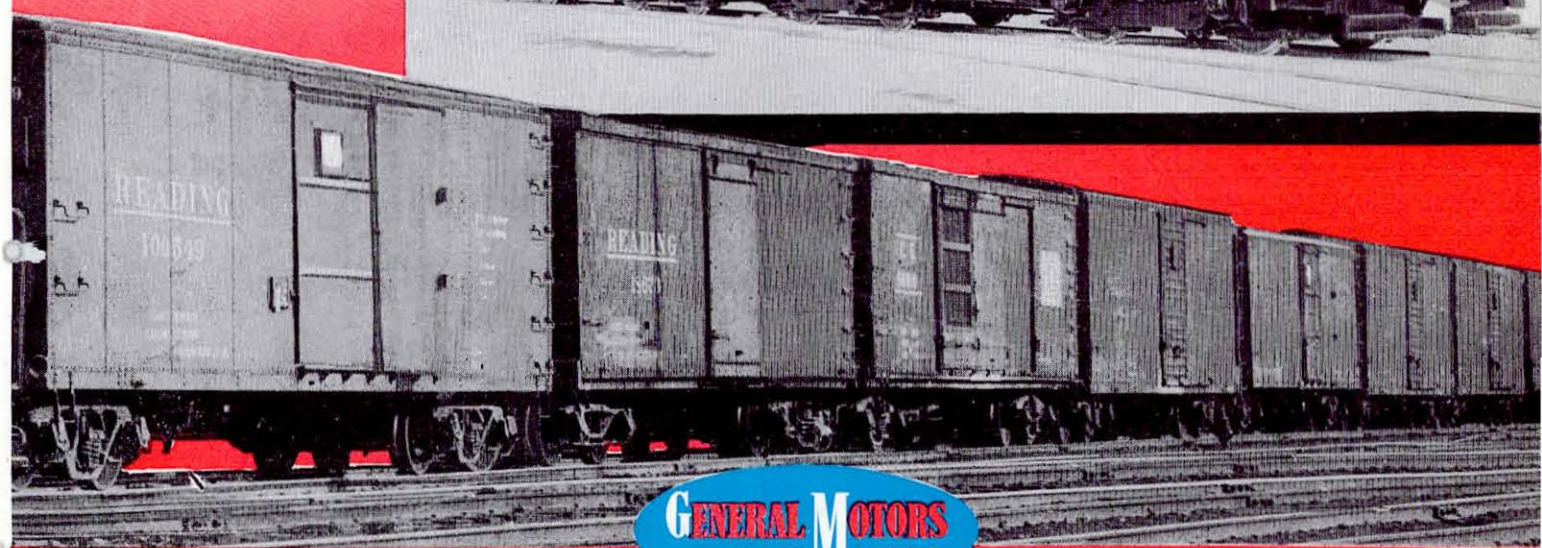


SO VITAL FOR VICTORY

2000 Hp. Transfer Locomotive

1000 Hp. Road-Switcher

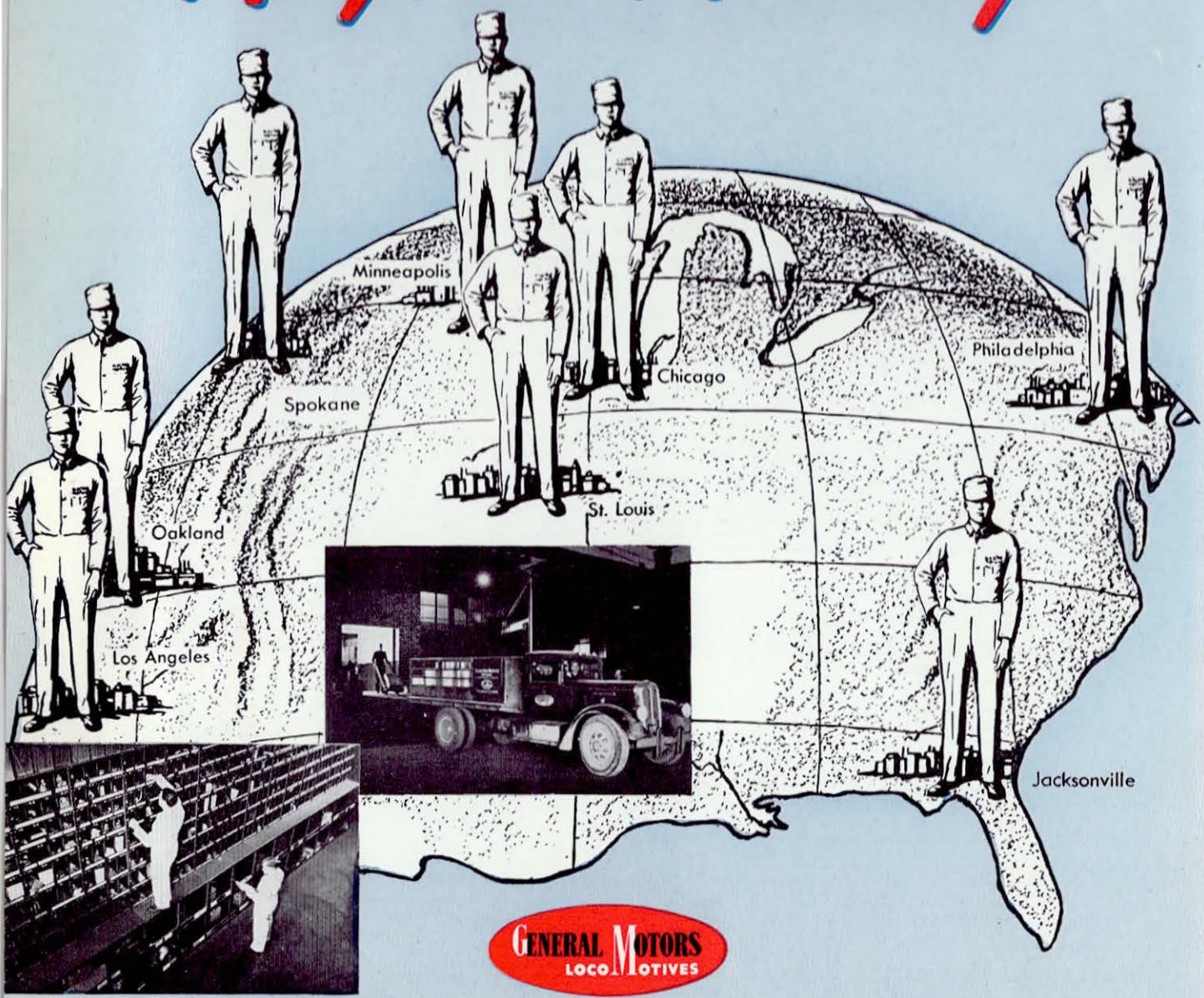




GENERAL MOTORS LOCOMOTIVES

GM SERVICE "WARDENS"

Keep 'em Rolling



GENERAL MOTORS LOCOMOTIVES

CONFIDENCE in a product and in those who make it results only from long, satisfactory dealings and proved superiority of performance and service. Fundamental, of course, is the element of quality . . . In the present emergency, with passenger and freight traffic at an all-time high, all available locomotives have been pressed into service and are being used to the limit of their capabilities . . . General Motors Diesel Road Locomotives are playing a vital part in the nation's transportation network and everything possible is being done to keep these super-performers rolling with the highest degree of availability . . . GM Service "Wardens" and eight strategically located parts depots STAND GUARD day and night to protect this equipment. Every order for parts leaves the closest depot within the working day and normally no replacement part is more than 24 hours away from any piece of GM equipment now in service. This long established service policy insures receiving the right part — at the right place — at the right time — and strengthens our pledge to "Keep 'Em Rolling" for VICTORY because

VICTORY IS OUR BUSINESS

ELECTRO-MOTIVE DIVISION

GENERAL MOTORS CORPORATION — LA GRANGE, ILLINOIS, U. S. A.

AMERICAN TRANSIT ASSOCIATION.—Guy C. Hecker, 292 Madison Ave., New York, N. Y.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 1427 Eye St. N. W., Washington, D. C. Annual meeting, April 27-29, 1943, Netherland-Plaza Hotel, Cincinnati, O.

ASSOCIATION OF AMERICAN RAILROADS.—H. J. Forster, Transportation Building, Washington, D. C.

Operations and Maintenance Department.—Charles H. Buford, Vice-President, Transportation Bldg., Washington, D. C.

Operating-Transportation Division.—L. R. Knott, 59 E. Van Buren St., Chicago, Ill.

Operating Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Transportation Section.—L. R. Knott, 59 E. Van Buren St., Chicago, Ill.

Fire Protection and Insurance Section.—W. F. Steffens, New York Central, Room 3317, 230 Park Avenue, New York, N. Y.

Freight Station Section.—L. R. Knott, 59 E. Van Buren St., Chicago, Ill.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Protective Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Safety Section—J. C. Caviston, 30 Vesey St., New York, N. Y.

Telegraph and Telephone Section.—W. A. Fairbanks, 30 Vesey St., New York, N. Y.

Engineering Division.—W. S. Lacher, 59 E. Van Buren St., Chicago, Ill.

Construction and Maintenance Section.—W. S. Lacher, 59 E. Van Buren St., Chicago, Ih

Electrical Section.—W. S. Lacher, 59 E. Van Buren St., Chicago, Ill.

Signal Section.—R. H. C. Balliet, 30 Vesey St., New York, N. Y.

Mechanical Division.—Arthur C. Browning, 59 E. Van Buren St., Chicago, Ill.

Electrical Section.—J. A. Andreucetti, 59 E. Van Buren St., Chicago, Ill.

Purchases and Stores Division.—W. J. Farrell (Executive Vice-Chairman), Transportation Building, Washington, D. C.

Freight Claim Division.—Lewis Pilcher, 59 E. Van Buren St., Chicago, Ill.

Motor Transport Division.—George M. Campbell, Transportation Bldg., Washington, D. C.

Car-Service Division.—E. W. Coughlin, (Assistant to Chairman), Transportation Building, Washington, D. C.

Finance, Accounting, Taxation and Valuation Department.—E. H. Bunnell, Vice-President, Transportation Building, Washington, D. C.

Accounting Division.—E. R. Ford, Transportation Building, Washington, D. C.

Treasury Division.—E. R. Ford, Transportation Building, Washington, D. C.

Traffic Department.—A. F. Cleveland, Vice-President, Transportation Building, Washington, D. C.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—F. L. Johnson, Claim Agent, Alton R. R., 340 W. Harrison St., Chicago, Ill.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—P. R. Austin, Johns-Manville Sales Corp., Merchandise Mart, Chicago, Ill.

CANADIAN RAILWAY CLUB.—C. R. Crook, 4415 Marcil Ave., N. D. G., Montreal, Que. Regular meetings, second Monday of each month, except June, July and August, Windsor Hotel, Montreal, Que.

CAR DEPARTMENT ASSOCIATION OF ST. LOUIS, MO.—J. J. Sheehan, 1101 Missouri Pacific Bldg., St. Louis, Mo. Regular meetings, third Tuesday of each month except June, July and August, Hotel De Soto, St. Louis, Mo.

CAR DEPARTMENT OFFICERS' ASSOCIATION.—Frank Kartheiser, Asst. to Vice-Pres., C. B. & Q., Chicago, Ill.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—W. J. Burns, (Second Vice-Pres.) General American Transportation Corp., Chicago, Ill. Regular meetings, second Monday of each month, except June, July and August, La Salle Hotel, Chicago, Ill.

CENTRAL RAILWAY CLUB OF BUFFALO.—Mrs. M. D. Reed, 1840-42 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, second Thursday of each month except June, July and August, Hotel Statler, Buffalo, N. Y.

EASTERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. T. Bougher, 424 W. 33rd St. (11th floor), New York, N. Y.

EASTERN CAR FOREMAN'S ASSOCIATION.—W. P. Dizard, 30 Church St., New York, N. Y. Regular meetings, second Friday of January, March, April, May, October and November, 29 W. 39th St., New York, N. Y.

LOCOMOTIVE MAINTENANCE OFFICERS' ASSOCIATION.—C. M. Lipscomb, 1721 Parker Street, No. Little Rock, Ark.

MASTER BOILER MAKERS' ASSOCIATION.—A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—Ben Smart, 7413 New Post Office Bldg., Washington, D. C. Annual meeting, September, 1943, Chicago, Ill.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. H. White, Room 1826, 208 S. La Salle St., Chicago, Ill.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, second Tuesday of each month, except June, July, August and September, Hotel Touraine, Boston, Mass.

NEW YORK RAILROAD CLUB.—D. W. Pye, 30 Church St., New York, N. Y. Regular meetings, third Thursday of each month, except June, July, August, September, and December, 29 W. 39th St., New York, N. Y.

PACIFIC RAILWAY CLUB.—William S. Wollner, P. O. Box A, Sausalito, Ca. Regular meetings, second Thursday of each alternate month, at Palace Hotel, San Francisco, Cal., and Hotel Hayward, Los Angeles, Cal.

RAILWAY BUSINESS ASSOCIATION.—P. H. Middleton, First National Bank Bldg., Chicago, Ill.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 308 Keenan Bldg., Pittsburgh, Pa. Regular meetings, fourth Thursday of each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRIC SUPPLY MANUFACTURERS' ASSOCIATION.—J. McC. Price, Allen-Bradley Company, 624 W. Adams St., Chicago, Ill.

RAILWAY FUEL AND TRAVELING ENGINEERS' ASSOCIATION.—T. Duff Smith, Room 811, Utilities Bldg., 327 S. La Salle St., Chicago, Ill.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 308 Keenan Bldg., Pittsburgh, Pa.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with Telegraph and Telephone Section of A. A. R.

RAILWAY TIE ASSOCIATION.—Roy M. Edmonds, 507 Shell Bldg., St. Louis, Mo.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Miss Lorene Kindred, Room 822, 310 S. Michigan Ave., Chicago, Ill. Annual meeting, September 21-23, 1943, Hotel Sherman, Chicago, Ill.

SIGNAL APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with A. A. R. Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, 4 Hunter St., S. E., Atlanta, Ga. Regular meetings, third Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta, Ga.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—D. W. Brantley, C. of Ga. Ry., Savannah, Ga.

TORONTO RAILWAY CLUB.—D. M. George, P. O. Box 8, Terminal "A," Toronto, Ont. Regular meetings, fourth Monday of each month, except June, July and August, Royal York Hotel, Toronto, Ont.

TRACK SUPPLY ASSOCIATION.—Lewis Thomas, Q. and C. Company, 59 E. Van Buren St., Chicago, Ill.

UNITED ASSOCIATIONS OF RAILROAD VETERANS.—Roy E. Collins, 112 Hatfield Place, Port Richmond, Staten Island, N. Y. Annual meeting, October, 1943.

WESTERN RAILWAY CLUB.—E. E. Thulin (Executive Secretary), 122 S. Michigan Ave., Chicago, Ill. Regular meetings, third Monday of each month, except January, June, July, August and September, Hotel Sherman, Chicago, Ill.

Abandonments

CHICAGO & NORTH WESTERN.—This road and the Chicago, Burlington & Quincy have applied to the Interstate Commerce Commission for approval of a plan whereby the North Western's 87-mile line between Illco, Wyo., and Shoshoni would be abandoned, the C. & N. W. to obtain permanent trackage rights over a like mileage of Burlington line between Illco and Boneville.

DELAWARE, LACKAWANNA & WESTERN.—Examiner Paul C. Albus in a proposed report in Finance Docket 13957 has recommended that the Interstate Commerce Commission authorize this road to abandon a branch line from Alford Junction, Pa., to Montrose, 9.93 miles.

Construction

ATLANTIC COAST LINE.—Division 4 of the Interstate Commerce Commission in Finance Docket 11709 has extended from March 31, 1943, to March 31, 1944, the time within which this company may complete a 0.95-mile extension in Columbus County, N. C., to serve a plant of the Riegel Paper Corporation.

CHESAPEAKE & OHIO.—Division 4 of the Interstate Commerce Commission in Finance Docket 11917 has extended from December 31, 1942, to December 31, 1944, the time within which this company may complete a 6.6-mile extension from a point at or near Van, W. Va.

CHICAGO & NORTH WESTERN.—This road and the Chicago, Burlington & Quincy have applied to the Interstate Commerce Commission for approval of an abandonment-trackage rights-construction plan which contemplates building two connecting tracks of 900 feet and three miles in length at Illco, Wyo. and between Shoshoni and Boneville. The other phases of the proposal involve abandonment by the C. & N. W. of its 87-mile line between Illco and Shoshoni and permanent trackage rights for it over the Burlington's line of like mileage between Illco and Boneville.

LONG ISLAND.—The 4.6-mile underground section of the still-uncompleted Atlantic Avenue grade crossing elimination project was opened to trains of the Long Island on December 28. Opening of the new Atlantic Avenue tunnel initiated the progressive scrapping of approximately 7,000 tons of steel now tied up in the old viaduct from East New York to Montauk avenue. The temporary tracks now in use will yield an additional 2,400 tons of steel, and the signal system, about 250,000 lb. of copper. This step also will permit completion of the East New York station, on which work is being speeded.

The $23,000,000 Atlantic Avenue project, which eliminates 20 grade crossings from East New York, in Brooklyn, N. Y., to Jamaica, Long Island, N. Y., was launched on October 13, 1939, when construction of temporary tracks was begun. Work on the permanent underground facilities was started on May 18, 1940, and the entire project is expected to be completed by mid-1943.

WAR DEPARTMENT.—The U. S. Engineer office, Cincinnati, Ohio, has awarded a contract amounting to more than $100,000 and less than $500,000 to W. A. Gurtler & Co., Chicago, for the construction of additional railroad facilities in Ohio. The U. S. Engineer office, Gladsden, Ala., has awarded a contract amounting to more than $100,000 and less than $500,000 to Royce Kershaw & Co., Montgomery, Ala., for railroad construction in Alabama. The U. S. Engineer office, Los Angeles, Cal., has awarded a contract in amount less than $100,000 and more than $50,000 to Shannahan Bros., Los Angeles, for the construction of a railroad spur in California. The U. S. Engineer

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office, Atlanta, Ga., has awarded a contract in amount less than $50,000 to S. B. Slack, Decatur, Ga., for railroad construction in Georgia and the U. S. Engineer office, Portland, Ore., has awarded a contract to Natt McDougall & Co., Portland, for the construction of a railroad spur in Oregon.

Financial

CENTRAL OF GEORGIA.—*Partial Interest Payment Authorized.*—The United States district court at Savannah, Ga., on December 23 authorized a partial payment of $1,150,633 in overdue interest on bonds of the Central of Georgia. At a hearing on December 1, mortgage holders had sought interest payments aggregating more than $3,000,000. The order provided for a $350,000,000 payment, covering two interest coupons, on the company's first mortgage bonds; $650,633 for the consolidated mortgage bonds to be used with $274,367 in cash now held by the trustee for these bonds to pay two interest coupons; and $150,000 to pay semi-annual coupons from July 1, 1934, to January 1, 1940, on the first mortgage bonds of the Chattanooga, Rome & Southern.

CHESAPEAKE WESTERN.—*Acquisition.*—Division 4 of the Interstate Commerce Commission has approved the application of this road to purchase the property of the Valley and then to dispose of the Lexington, Va., terminal facilities of that road to the Chesapeake & Ohio, to abandon, under authority already granted by the commission, that part of the line, 35.42 miles between Staunton, Va., and East Lexington, and to operate the 24.64-mile segment between Harrisonburg, Va., and Staunton. The Valley has been operated by the Baltimore & Ohio, owner of all of its bonds and most of its capital stock. The purchaser is to pay $150,000 for the property and to assume certain obligations covering part of the cost of an industrial spur, but will receive the proceeds of the sale of the Lexington terminal and of the material salvaged from the abandoned segment, making the estimated net cost $111,000.

CHICAGO & ILLINOIS MIDLAND.—*Elected chairman of the board.*—John F. Gilchrist, president of the Chicago & Illinois Midland from 1914 to June, 1940, has been elected a director and chairman of the C. & I. M. (owned by the Commonwealth Edison Company).

CHICAGO & NORTH WESTERN.—*Seeks To Repay RFC Debt.*—Attorneys for the Chicago & North Western are reported to have asked the United States Supreme Court for permission to use part of the $60,000,000 in cash or its equivalent now in the railroad's treasury to repay the road's $48,178,750 debt to the Reconstruction Finance Corporation as a step toward eventually permitting shareholders to realize a partial return on their investment.

CHICAGO & NORTH WESTERN.—*Trackage Rights.*—This road and the Chicago, Burlington & Quincy have asked the Interstate Commerce Commission to approve arrangements whereby the North Western would obtain permanent trackage rights over the Burlington's 87-mile line between Illco, Wyo., and Boneville. The plan contemplates abandonment by the C. & N. W. of its own 87-mile line between Illco and Shoshoni, and construction of two connecting tracks.

GULF, MOBILE & OHIO.—*New director.*—Frank M. Mayfield, president of the Scruggs Vandervoort and Barney Company, St. Louis, Mo., has been elected a director of the Gulf, Mobile & Ohio, succeeding E. D. Scruggs, Washington, D. C., who has resigned.

Dividends Declared

Atlanta & West Point.—$5.00, payable December 19, 1942, to holders of record December 14, 1942.

Carolina, Clinchfield & Ohio.—$1.25, quarterly, payable January 20 to holders of record January 9.

Norfolk & Western.—4 Per Cent Adj. Preferred, $1.00, quarterly, payable February 19 to holders of record January 30.

Northern Pacific.—(Resumed) $1.00, payable February 1 to holders of record January 4.

Reading Company.—25¢, quarterly, payable February 11 to holders of record January 14.

Southern.—Non-cumulative Preferred, $1.25, payable March 15, June 15 and September 15, to holders of record February 15, May 15 and August 14, respectively.

Tennessee Central.—7 Per Cent Convertible Preferred (Accumulated), $7.00, payable December 24, 1942, to holders of record December 17, 1942.

Supply Trade

American Steel Foundries

The net income of the American Steel Foundries for the fiscal year ending September 30, 1942 amounted to $2,906,343 after Federal taxes on income of $9,800,000, according to the annual report of the company. The fiscal year 1942 was begun with unfilled orders amounting to approximately $33,000,000 while at the close of the fiscal year they amounted to $90,000,000. The activities of the company are now devoted largely to war work.

The name of the **Scully Steel Products Company,** Chicago, subsidiary of the United States Steel Corporation, will be changed to **United States Steel Supply Company** on January 1, 1943, to identify the supply company more closely with other subsidiaries.

A. A. Frank, executive vice-president of the **Standard Railway Equipment Manufacturing Co.,** Chicago, has been elected president to succeed **Walter P. Murphy,** whose death on December 16 was reported in the *Railway Age* as of December 19. At the same time Mr. Frank succeeds Mr. Murphy as president of the **Standard Railway Devices Company,** of which he was vice-president; **The Standard Railway Equipment Manufacturing Co.** (Canada) Ltd., of which he was executive vice-president; and the **Railway Metal Products Company.** Mr. Frank will continue as president of the **Standard Railway Equipment Company.**

Railway Officers

FINANCIAL, LEGAL AND ACCOUNTING

Ernest A. Anderson, whose appointment as auditor of the Atlantic Coast Line, with headquarters at Wilmington, N. C., was announced in the *Railway Age* of December 19, was born on March 2, 1903, at Galveston, Texas. Mr. Anderson entered railroad service in February, 1918, as an employee of the Gulf, Colorado & Santa Fe at Galveston, and in August, 1918, left that road to go with the Galveston, Houston & Henderson. In August, 1926, he became examiner of accounts, Bureau of Accounts, of the Interstate Commerce Commission, at a branch office at Houston, Texas. In May, 1939, he went to Chicago, as chief fiscal accountant of the Railroad Retirement Board, and in February, 1940,

E. A. Anderson

was appointed chief cashier, with headquarters at Washington, D. C., becoming chief of the accounts section in October, 1940. He was appointed chief of the accounts section of the War Production Board in February, 1942. In August, 1942, Mr. Anderson was appointed chief of accounts and audits branch of the WPB at Washington, which position he was holding at the time of his recent appointment to the Atlantic Coast Line.

OPERATING

A. L. Enborg has been appointed acting trainmaster of the Canadian National, with headquarters at Gravenhurst, Ont., succeeding **J. R. Carr,** who has been appointed acting assistant superintendent of the Allandale division, with headquarters at Allandale, Ont., succeeding **C. Metcalf,** who is on leave of absence because of illness.

R. C. Wheeler, assistant superintendent of the Canadian Pacific at Medicine Hat, Alta., has been promoted to superintendent of the Medicine Hat division, with the same headquarters, succeeding **E. S. McCracken,** whose promotion to general superin-

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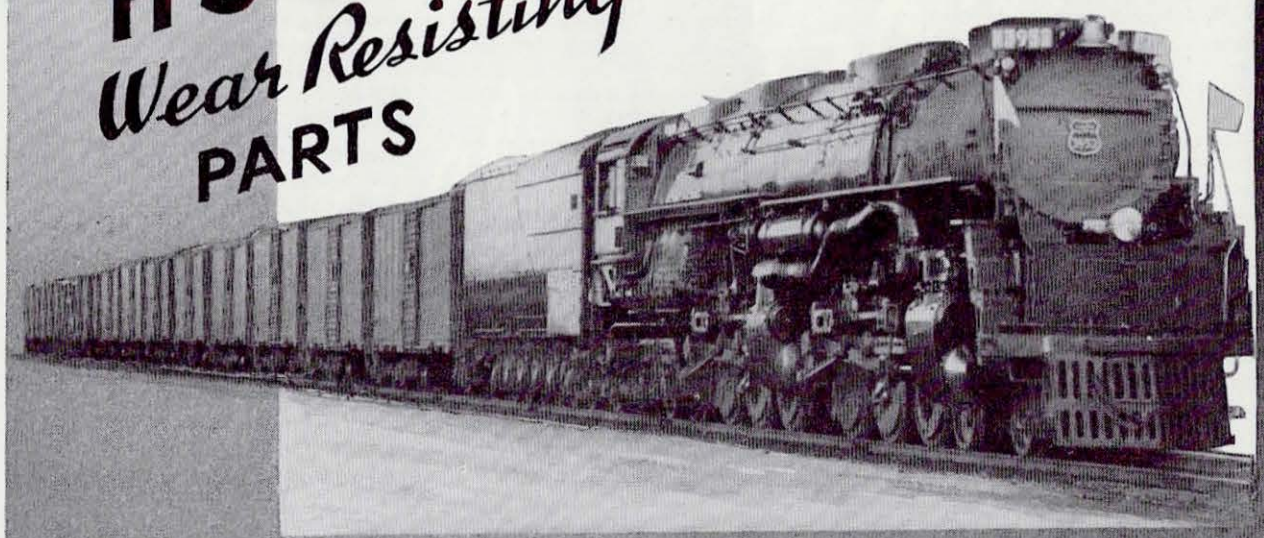
HSGI *Wear Resisting* PARTS



INSURE EXTRA SERVICE

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Vital factors which help to insure against the loss of power, fuel and excessive roundhouse repairs are Hunt-Spiller *Air Furnace* Gun Iron wear-resisting parts in the valves and cylinders.

HSGI Bushings, Bull Rings and Packing Rings resist frictional wear and high temperatures . . . insure pressure-tight operation for maximum periods between renewals.

More and more railroads are applying HSGI wear-resisting parts in the valves and cylinders to insure that extra service which is necessary for victory transportation.

HSGI
Reg. U. S. Trade Mark
Cylinder Bushings
Cylinder Packing Rings
Pistons or Piston Bull Rings
Valve Bushings
Valve Packing Rings
Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings
Finished Parts
Dunbar Sectional Type Packing
Duplex Sectional Type Packing
for Cylinders and Valves
(Duplex Springs for Above
Sectional Packing)
Cylinder Snap Rings
Valve Rings All Shapes
Light Weight Valves
Cylinder Liners and Pistons
for Diesel Service

HUNT-SPILLER MFG. CORPORATION
V. W. Ellet, *President* — E. J. Fuller, *Vice-Pres. & Gen. Mgr.*

383 Dorchester Ave. *Office & Works* South Boston, Mass.

Canadian Representative: Joseph Robb & Co., Ltd., 5575 Cote St. Paul Rd., Montreal, P. Q.
Export Agent for Latin America:
International Rwy. Supply Co., 30 Church Street, New York, N. Y.

HUNT-SPILLER *Air Furnace* GUN IRON

of the Canadian Pacific at Boston, Mass., in 1913 and has been associated with the company since that time except for his service with the United States Navy during World War I. He has had experience at many points in the United States, including Boston, New York and Los Ange-

H. A. Lee

les, Cal. He was appointed assistant general passenger agent at Montreal in 1940, which position he was holding at the time of his recent promotion. Mr. Lee will have jurisdiction over the Ontario and Algoma districts.

C. M. York, assistant traffic manager of the Macon, Dublin & Savannah, has been promoted to traffic manager, with headquarters as before at Macon, Ga., succeeding **G. H. Whitaker,** who has retired after 20 years of service as traffic manager of that road. Mr. York, born at Ranseur, N. C., has been in railroad service for 35 years. He started with the Macon, Dublin & Savannah during World War I, having charge of troop movements into and out of Camp Wheeler, Macon. He served as commercial agent at Atlanta, Ga., and Cincinnati, Ohio, from 1920 to 1939, when he was promoted to assistant traffic manager, with headquarters at Macon, which position he was holding at the time of his recent promotion. In his new post, Mr. York will be in charge of all matters pertaining to general passenger and freight traffic work.

Mr. Whitaker, a native of Terrell County, Ga., entered railway service in 1893, as clerk-cashier of the Savannah, Americus & Montgomery (now Seaboard Air Line), at Americus, Ga. In 1903, he went with the Seaboard Air Line as commercial agent at Columbus, Ga., resigning in 1912, to accept the position of traffic manager of the Hardaway Contracting Co., at Columbus. During World War I he was in executive charge of construction contracts to build Fort Jackson at Columbia, S. C. After the completion of this job, he built Southern Field, at Americus, and then returned to Columbia, where he was associated with the construction of North Fort Jackson until after the armistice, when he became president of the Carolina Wholesale Hardware Company at Columbia. Subsequently, he returned to the Seaboard Air Line as commercial agent at Macon, which position he held until his appointment as traffic manager of the Macon, Dublin & Savannah 20 years ago.

ENGINEERING & SIGNALING

H. F. Smith, crossing engineer of the Norfolk & Western, has been promoted to assistant engineer, with headquarters as before at Roanoke, Va., succeeding **W. H. Bettis,** who has been transferred to Portsmouth, Ohio, succeeding **C. E. Armstrong,** who has retired.

Thomas L. Landers, whose appointment as chief engineer of the Atlantic region of the Canadian National at Moncton, N. B., succeeding **Frederick O. Condon,** retired, was announced in the *Railway Age* of December 5, was born on December 15, 1887, at Farnham, Que. Mr. Landers was graduated from Bishops college, Lennoxville, Que., in 1908, after which he attended McGill university until 1909. He entered railway service in June, 1910, as a rodman of the Canadian Pacific at Farnham. Remaining at Farnham, he was subsequently appointed draftsman, in February, 1911, and transitman in April, 1912. In October, 1913, he left the Cana-

T. L. Landers

dian Pacific to become transitman of the Canadian Government Railways (now Canadian National), at New Glasgow, N. S. He was appointed resident engineer of the Canadian National, with headquarters at Truro, N. S., in May, 1915, and in January, 1917, became assistant engineer at Levis, Que., maintaining this position until September, 1919, when he was appointed division engineer at Edmonston, N. B. Mr. Landers was advanced to engneer, maintenance of way, at Moncton, in November, 1927, and remained in this capacity until his recent promotion.

Mr. Condon was born on July 21, 1878, at Moncton. On February 14, 1893, he entered the employ of the Intercolonial (now Canadian National) as a messenger in the office of the chief engineer at Moncton. On April 1, 1912, he was advanced to resident engineer of the Intercolonial at Moncton, and on September 1, 1913, was transferred to the Canadian Government Railways as resident engineer at Campbellton, N. B. On January 1, 1916, he was appointed district engineer at Moncton, and until his recent retirement maintained headquarters at that city. On March 1, 1923, he was appointed engineer, maintenance of way, of the Canadian National, and on May 15, 1927, was appointed principal assistant engineer, becoming office engineer on September 1, 1932. On January 1, 1938, Mr. Condon was appointed chief engineer of the At-

F. O. Condon

lantic region, the position from which he recently retired. Mr. Condon is a member of the American Railway Engineering Association; the Engineering Institute of Canada, of which he was counsellor in 1926, and vice-president in 1928 and 1929, and a member and past president of the New Brunswick Association of Professional Engineers.

MECHANICAL

Horace Plouffe has been appointed locomotive foreman of the Canadian National, with headquarters at Garneau, Que., succeeding **M. Snilner,** assistant foreman, assigned to night shift.

J. D. Rezner, general car foreman of the Chicago, Burlington & Quincy, has been promoted to the newly created position of superintendent of the car department, with headquarters as before at Chicago.

SPECIAL

Benjamin Mendez has been appointed acting material agent of the Mexican Government Railway System, with headquarters at New York.

R. C. Overton, executive assistant of the Chicago, Burlington & Quincy, has been appointed to the newly created position of research director of the Burlington Lines, which include also the Colorado & Southern, the Ft. Worth & Denver City and the Wichita Valley, with headquarters as before at Chicago.

OBITUARY

W. N. McGehee, general attorney of the Southern, with headquarters at Washington, D. C., died on December 17, at a hospital at Columbus, Ohio.

L. T. Nichols, who retired as assistant to the vice-president of the Carolina & Northwestern at Chester, S. C., in 1937, died on December 26, at his home in that city at the age of 84.

HSGI *Wear Resisting* PARTS

INSURE EXTRA SERVICE

TODAY'S heavy wartime transportation schedules demand super locomotive performance.

Vital factors which help to insure against the loss of power, fuel and excessive roundhouse repairs are Hunt-Spiller *Air Furnace* Gun Iron wear-resisting parts in the valves and cylinders.

HSGI Bushings, Bull Rings and Packing Rings resist frictional wear and high temperatures . . . insure pressure-tight operation for maximum periods between renewals.

More and more railroads are applying HSGI wear-resisting parts in the valves and cylinders to insure that extra service which is necessary for victory transportation.

HSGI
Reg. U. S. Trade Mark
Cylinder Bushings
Cylinder Packing Rings
Pistons or Piston Bull Rings
Valve Bushings
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Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings
Finished Parts
Dunbar Sectional Type Packing
Duplex Sectional Type Packing
for Cylinders and Valves
(Duplex Springs for Above
Sectional Packing)
Cylinder Snap Rings
Valve Rings All Shapes
Light Weight Valves
Cylinder Liners and Pistons
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HUNT-SPILLER *Air Furnace* GUN IRON

tendent of the Algoma district, with headquarters at North Bay, Ont., was reported in the *Railway Age* of October 31.

Perry M. Shoemaker, whose appointment as general superintendent of the Delaware, Lackawanna & Western at New York was announced in the *Railway Age* of December 26, was born on July 15, 1906, at Elmira, N. Y., and was graduated from the University of Michigan with a bachelor of science degree in 1928. Subsequently he was awarded the Strathcona Fellowship by Yale university, which conferred upon him the degree of master of science in transportation and engineering. While studying at the University of Michigan, Mr. Shoemaker was employed by the Pennsylvania during the summers of 1926 and 1927 as a track laborer. Following graduation he became dynamometer assistant of the Erie, and from 1929 to 1932 he served as freight checker, terminal yardmaster and general yardmaster of the Erie. He entered the service of the New York, New Haven & Hartford in 1934 as research assistant, subsequently becoming superintendent of trans-

Perry M. Shoemaker

portation. On June 1, 1941, he left the employ of the New York, New Haven & Hartford to become transportation assistant of the Delaware, Lackawanna & Western. In September, 1941, Mr. Shoemaker was appointed superintendent of the Morris and Essex division of the latter road at Hoboken, N. J., which position he was holding at the time of his recent appointment.

TRAFFIC

A. K. Heaton has been appointed assistant general freight agent of the Missouri Pacific, with headquarters at St. Louis, Mo.

Ian Warren, overseas passenger manager of the Canadian Pacific, has been appointed assistant passenger traffic manager, with headquarters as before at Montreal, Que. The position of overseas passenger manager has been abolished, and in his new position, Mr. Warren will have charge of military and other special traffic, as well as overseas traffic. Mr. Warren, who was born on July 27, 1904, at Montreal, Que., attended St. Kevin's college. He entered railroad service in 1920, as an employee in the office of the chief engineer of the Canadian Pacific. After experience in the engineering and construction departments, he joined the passenger department in 1924, as secretary to the assistant passenger traffic manager, serving in this capacity

Ian Warren

until 1927, when he became assistant chief clerk in the passenger traffic department. He was appointed assistant to the overseas passenger manager in 1930, and subsequently in 1939 was advanced to overseas passenger manager, which position he held until his recent appointment.

Frank C. Nelson, whose promotion to freight traffic manager, Central district, of the Southern Pacific, with headquarters at San Francisco, Cal., was reported in the *Railway Age* of December 12, was born at San Francisco on August 2, 1892, and entered railway service on December 24, 1908, as a clerk in the freight accounting department of the Southern Pacific at San Francisco, Cal. From 1917 to 1919, during World War I, he served as a first lieutenant in the field artillery of the U. S. Army, returning to the Southern Pacific on April 1, 1920, as a clerk in the general freight department at San Francisco. He

Frank C. Nelson

later served in various other clerical positions and on June 27, 1927, he was advanced to chief of the Divisions bureau. Mr. Nelson was appointed commerce agent at San Francisco on January 16, 1930, and on August 1, 1934, he was promoted to assistant general freight agent. On February 1, 1940, he was advanced to assistant to the freight traffic manager in charge of rates and divisions, which position he held until his recent promotion, effective December 3.

K. M. Potter, division freight agent of the Pennsylvania at Erie, Pa., has been appointed general freight agent of the Long Island, with headquarters at Pennsylvania station, New York, succeeding **H. M. Phillips,** who has been furloughed from the railroad to serve as a major in the Army Transportation Corps.

Harold C. James, assistant general passenger agent of the Canadian Pacific at Toronto, Ont., has been promoted to general passenger agent at Montreal, Que. **H. A. Lee,** assistant general passenger agent at Montreal, has been promoted to general passenger agent, with headquarters at Toronto. Mr. James entered railway service with the Canadian Pacific in 1914 as a junior clerk in the passenger department at St. John, N. B., leaving that

H. C. James

position in 1915 for overseas service with the Canadian Expeditionary Force. Upon rejoining the Canadian Pacific in 1919, he was appointed ticket clerk at St. John, and in 1921 was appointed passenger agent, port staff, at Quebec, Que., and St. John, later becoming traveling passenger agent. In the latter part of 1922, Mr. James was transferred to Kansas City, Mo., and in 1926 became city passenger agent at St. Louis, Mo., serving in that capacity until 1927, when he became chief clerk at St. Louis. In 1932, he was appointed district passenger representative at Dallas, Tex., and in 1935 went to Atlanta, Ga., as general agent. Mr. James served as assistant cruise director on the Empress of Australia world cruise of 1929-30. He returned to Canada as district passenger agent of the New Brunswick district in 1937, and in February, 1938, was promoted to assistant general passenger agent at Montreal. In November, 1938, Mr. James was transferred to Toronto, in which position he remained until his recent appointment. In his new position, Mr. James will have jurisdiction over the Quebec and New Brunswick districts in Canada and the general agencies in Eastern United States.

Mr. Lee joined the passenger department

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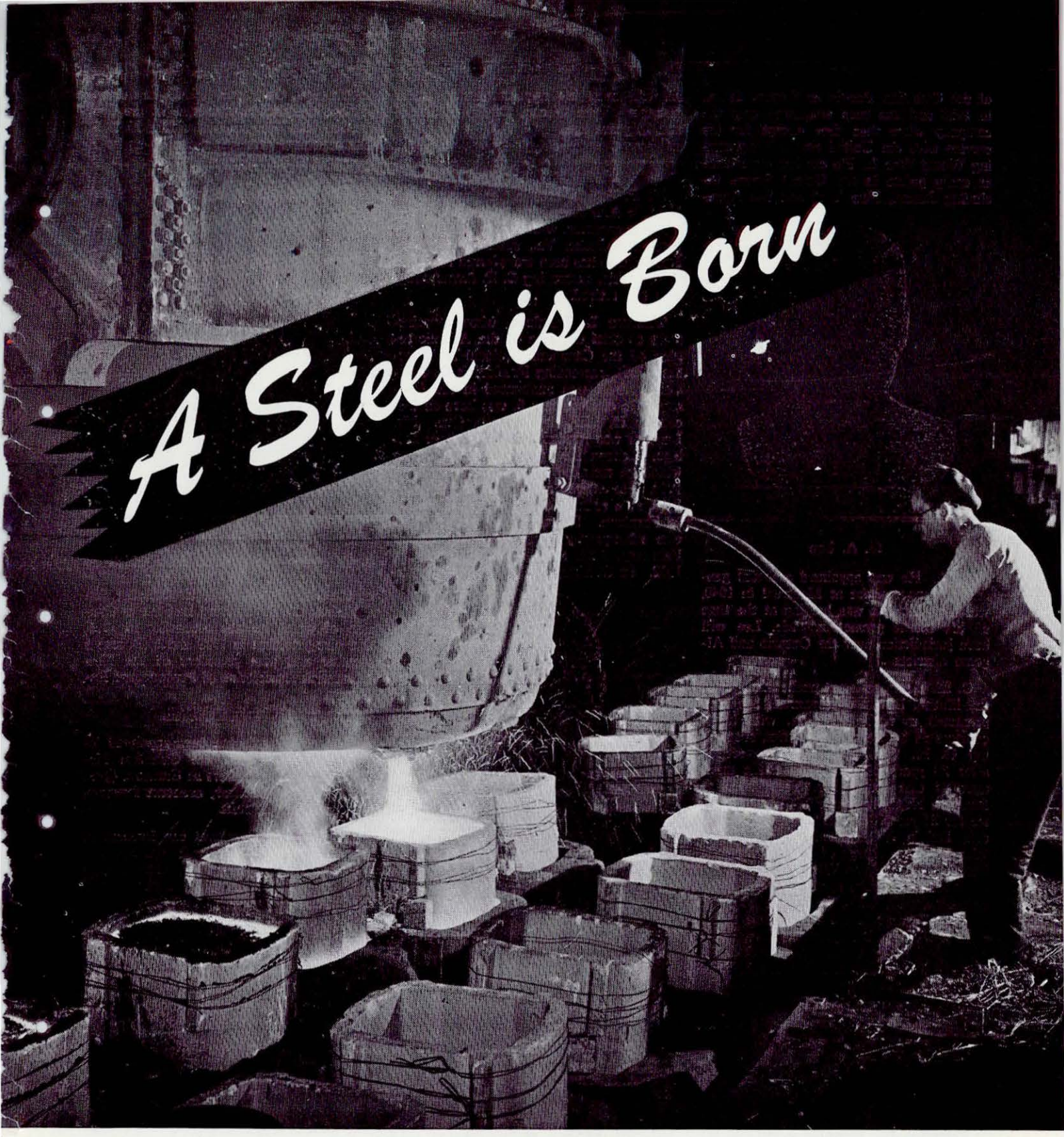

Pouring the first heat of a new "A.W." Alloy Steel is a moment to long remember. The promise of Victory and the vision of a better America are in every hot top ingot. Our first thought today is to produce the best steels possible in the greatest volume for ships, tanks, guns or the equipment which produces them. If you are engaged in war production and have an alloy steel problem, we will do our best to help you. Personal attention has been the keynote of "A.W." service since 1826.

ALAN WOOD STEEL COMPANY

MAIN OFFICE AND MILLS: CONSHOHOCKEN, PENNSYLVANIA : SINCE 1826. District Offices and Representatives: Philadelphia, New York, Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, St. Paul, New Orleans, Pittsburgh, Roanoke, Sanford, N. C., St. Louis, Los Angeles, San Francisco, Seattle, Montreal.

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L. T. Nichols, who retired as assistant to the vice-president of the Carolina & Northwestern at Chester, S. C., in 1937, died on December 26, at his home in that city at the age of 84.

Complete COMBUSTION

HANNA STOKER
Type H-4

A PROPER system of stoker firing must provide for sizing of the coal, conditioning of same, direction of delivery, separation of fine from coarse coal and scientific distribution.

When rightfully accomplished these five primary functions assure complete combustion, sustained boiler horse-power and economical fuel consumption. The design of the HANNA STOKER provides for all these essentials.

Supervisors of locomotive operation frequently comment upon the light stacks of HANNA fired locomotives — that is their way of gauging firing efficiency—and all firemen are amazed at the simplicity of controls and precision of distribution.

HANNA STOKERS are dependable and economical to maintain. You do not have to worry about road failures or expensive tie-ups for repairs.

THE HANNA STOKER COMPANY
CINCINNATI **OHIO**

HANNA STOKER

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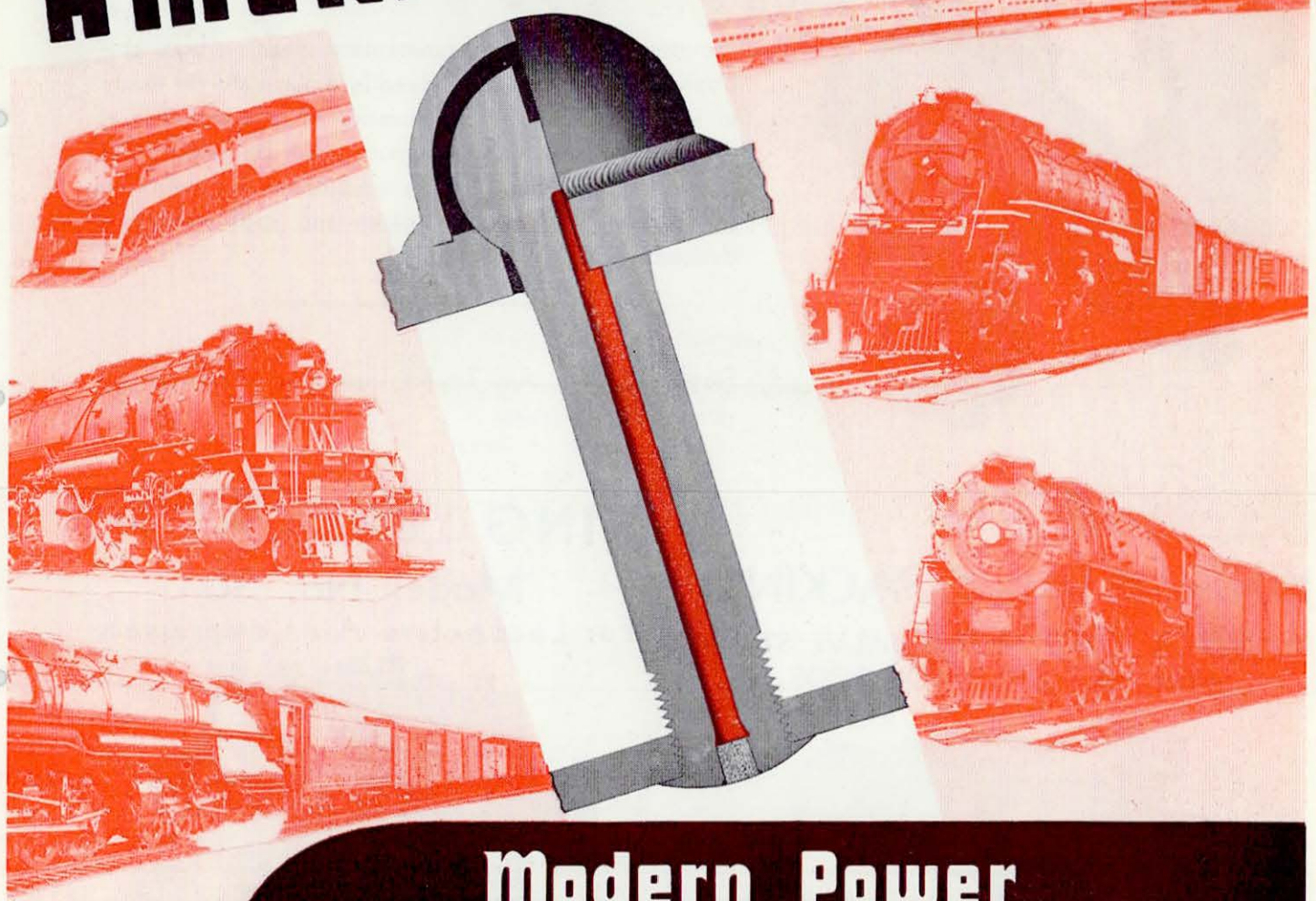
Breaking Achievements
AMERICAN RAILWAYS



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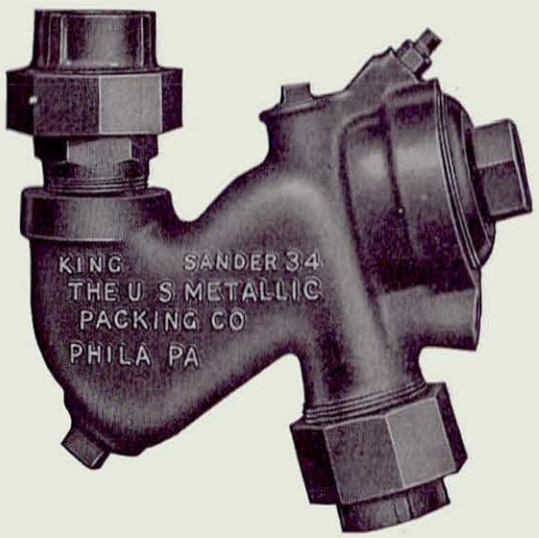
Equipped with
HOLLOW FLEXIBLE STAYBOLTS

COMPANY BRIDGEVILLE PENNSYLVANIA

KING PRODUCTS

FOR EFFICIENT LOCOMOTIVE OPERATION



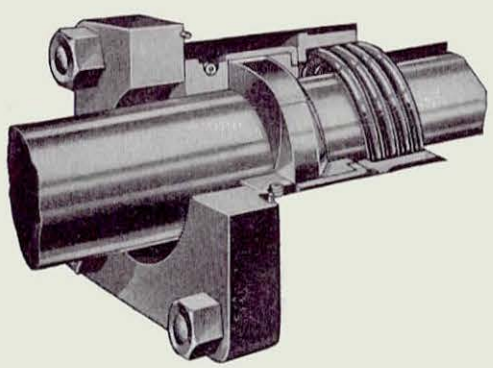
KING SANDER TRAP Nº 34

Provision for automatic momentary cleaning blast embodied within the trap. Readily adjustable for grade of sand, air pressure and quantity of sand required at the rail. Accurate adjustments may be made with sander in operation. After adjustment the adjusting screw may be locked in place and spot welded if desired.

Single, Duplex and Triplex operating valves to suit varying arrangements.

KING METALLIC PACKING

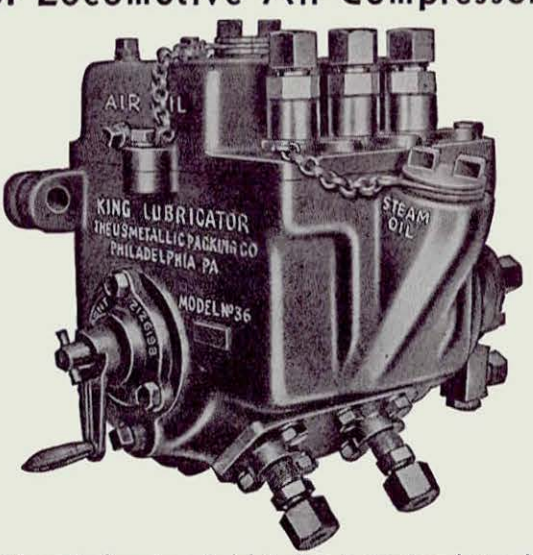
MADE FOR PISTON RODS, VALVE STEMS AND AIR PUMP PISTON RODS



King Piston Rod Packing

The King Packing Ring is made of special composition metal in two interlocking halves with sliding plate, retainer and springs of suitable material. Ideal for high pressures and superheated steam.

KING LUBRICATOR
Model No. 36
For Locomotive Air Compressors



Provides entirely automatic lubrication to steam and air cylinders. Starts when compressor starts and stops when compressor stops. Has separate reservoirs for steam cylinder and air cylinder oils. May be adjusted to a wide range of feeds. All working parts in a constant bath of oil. No ratchet mechanism.

The U. S. Metallic Packing Company

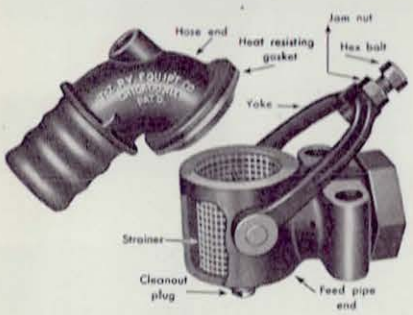
PHILADELPHIA • PENNSYLVANIA

Pyle-National continues to furnish dependable railway electrical equipment in a full range of standard types designed to meet the needs of present-day severe service conditions. Years of specialized experience enable Pyle-National to contribute effectively to the dependable railroad transportation so valuable to our country today.

- HEADLIGHTS
- TURBO-GENERATORS
- CONDUIT FITTINGS FOR LOCOMOTIVE, CAR AND SHOP WIRING
- CAB LIGHTING FIXTURES
- FLOODLIGHT PROJECTORS
- PLUGS AND RECEPTACLES FOR STAND-BY AIR CONDITIONING, BATTERY CHARGING, AND OTHER SERVICES
- MULTI-VENT SYSTEM OF AIR DISTRIBUTION

THE PYLE-NATIONAL COMPANY
1334-58 North Kostner Avenue • Chicago, Illinois
Offices: New York • Baltimore • Pittsburgh • St. Louis • St. Paul • San Francisco
Export Department: International Railway Supply Co., New York
Canadian Agents: The Holden Co., Ltd., Montreal

WARTIME QUALITIES
Built Into T-Z PRODUCTS



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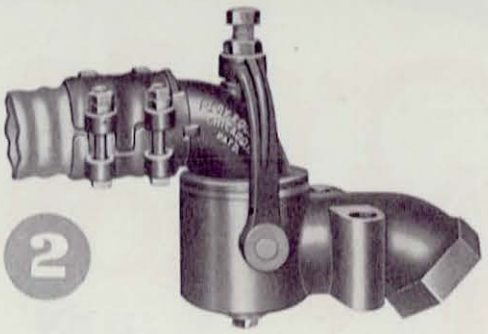

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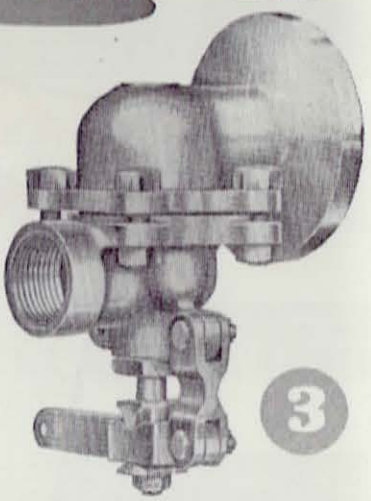


3

PROVED and APPROVED *By Years of Service*

1 T-Z STRAIGHT SCREW TYPE COUPLER — T-Z couplers range in size from 2½ in. to 4½ in. inclusive. They are available in any combinations to be used with water conditioners, feed water heaters and with injectors and inspirators. The hose end can be used on either straight or angle type couplers.

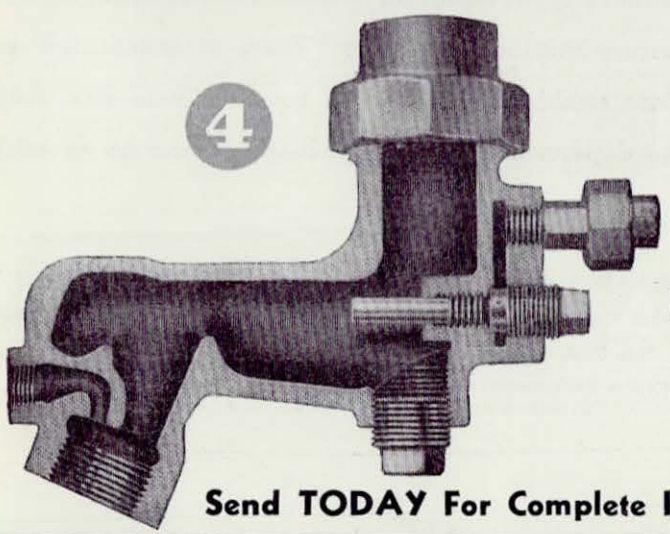
2 T-Z 45 DEG. ANGLE SCREW TYPE COUPLER— The angle type allows the hose to assume a natural bend. The substantial corrugated hose clamp is designed to prevent turning or slipping off of the hose end.

3 T-Z BLOW-OFF VALVE — Only two internal wearing parts. Valve and valve seats of special alloy metals to withstand corrosion and abrasive action. Built for working pressures of 500 lbs.

4 BREWSTER SAND TRAP—Unique design of this trap makes possible air and sand volume adjustments without disconnection of air supply lines.

5 T-Z CYLINDER COCKS — Only *two* wearing parts—the piston and spring—providing long service — low maintenance — full 1¼" exhaust from Cylinder.

ALL OF THIS EQUIPMENT PATENTED



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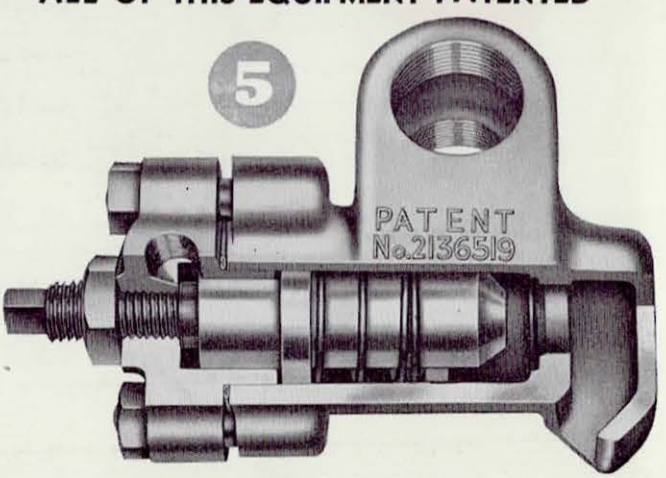


5

Send TODAY For Complete Information On These Products!

T-Z RAILWAY EQUIPMENT CO., INC.

CHICAGO **ILLINOIS**

MOTOR WHEEL CORPORATION **Lansing, Michigan**

G. S. Turner, President
National Sales Representatives

NO MORE

driving-journal or crown-bearing

RENEWALS

to existing equipment, should be necessary because of wear,

FOR THE DURATION

if equipped with Hennessy Mechanical Journal Lubricators

HENNESSY LUBRICATOR

Barring accident, *present* Crown Bearings and Journals, now in good condition—*can be made to last for the duration*—without replacement.

Reduced thrust-area wear and lowered operating temperatures extend the life of these parts indefinitely.

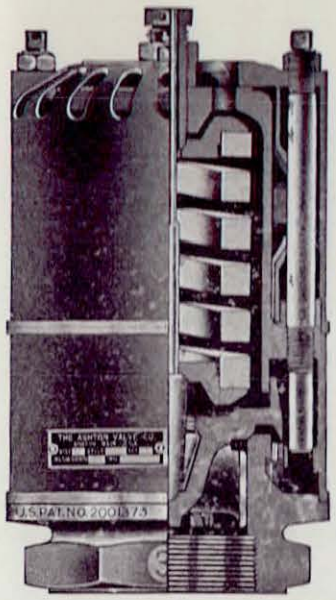
Heat and fatigue cracks in journals rarely occur with OIL-lubrication.

More than 4600 Hennessy Driving-Journal Lubricators now in use on road locomotives.

Hennessy Lubricator Company, 75 West Street, New York City.

MECHANICAL OIL LUBRICATION FOR ALL RAILWAY JOURNALS

(For typical locomotives, equipped with Hennessy OIL-Lubricators, see our advertisements in Railway Age for Nov. 7, Oct. 17 and Dec. 12)

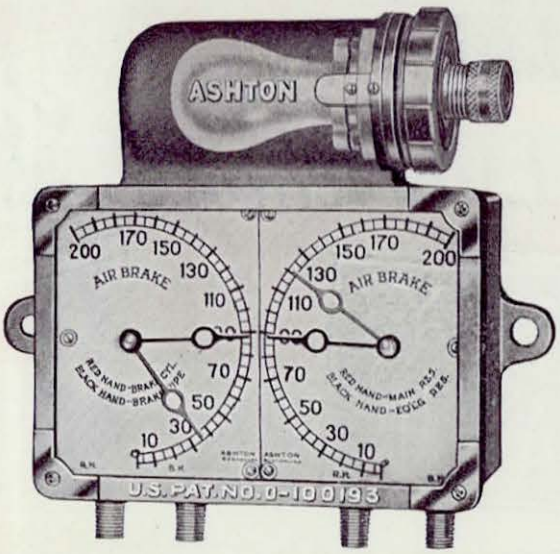


ASHTON FC-10 MUFFLED SAFETY VALVE

The FC-10 Muffled Locomotive Safety Valve was developed to meet the condition of increased evaporating efficiency on high pressure locomotive boilers. It has operated successfully for a period of over ten years in road tests and regular service on locomotives carrying pressures up to 300 pounds per square inch. Throughout this period it has operated without the necessity of the removal of any parts.

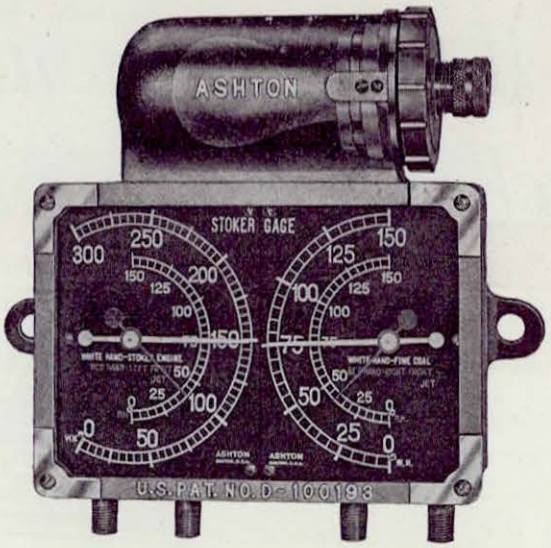
ASHTON NO. 52 DI-3 6¾" DOUBLE DIAL LOCOMOTIVE STEAM GAGE, LAMP HOUSING CAST INTEGRAL WITH CASE

The New Style No. 52 DI-3 Locomotive Steam Gage eliminates the need of separate boiler pressure gages for engineer and fireman. Each face of the Gage has a dial and hand illuminated by a standard electric lamp bulb and can be seen from either right or left side of the locomotive. Dial has a permanent white porcelain surface which is positively non-glare and can readily be cleaned.



ASHTON NO. 62 QI-7 QUADRUPLEX ILLUMINATED LOCOMOTIVE AIR BRAKE GAGE. LAMP HOUSING CAST INTEGRAL WITH FACE RING.

The principal object of this new design is to place in a centralized position the two air gages and the indicating hands of same as near together as possible, so that the engineer by concentrating his vision particularly on the brake pipe and equalizing reservoir hands may regulate more uniformly and accurately his brake applications and secure smooth handling of the train.



ASHTON NO. QI-9 QUADRUPLEX ILLUMINATED LOCOMOTIVE STOKER GAGE

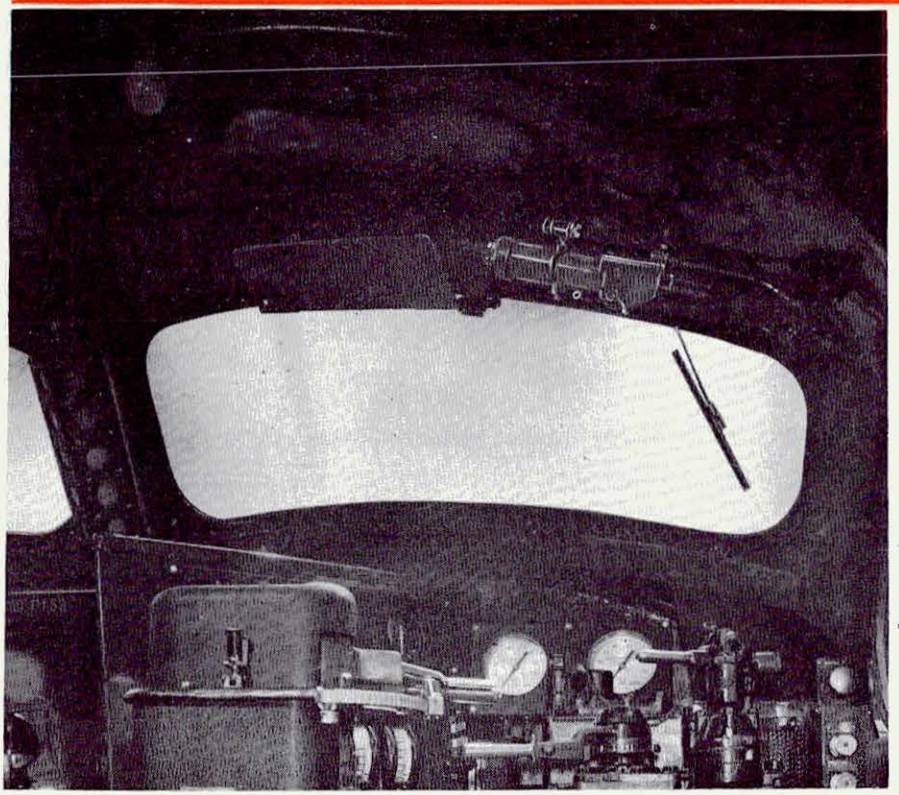
The Ashton Locomotive Stoker Gage is a combination of two duplex gages, ordinarily used in stoker service, mounted in heavy rectangular dust-proof case.

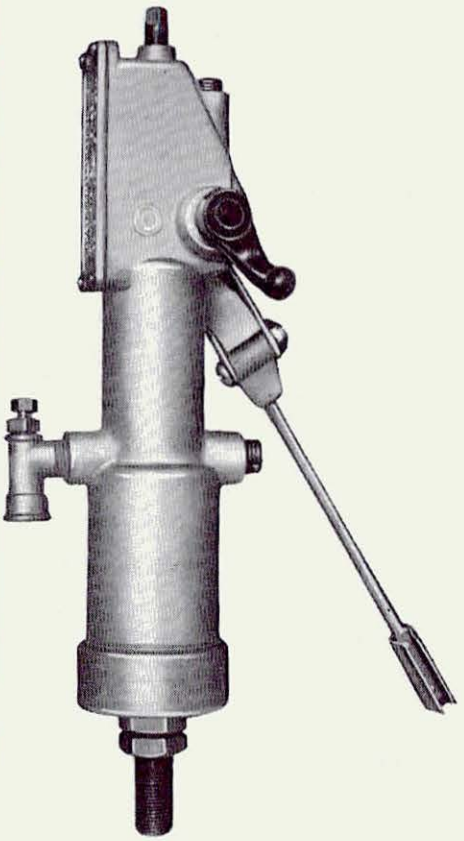
Combining the two gages in one case reduces the space required for this equipment in locomotive cabs. Especially adapted to service on the HT and HT-I stokers or other types where three or four pressure indications are required.

THE ASHTON VALVE COMPANY

161-179 FIRST STREET, CAMBRIDGE, MASS.

CHICAGO, ILL. NEW YORK, N. Y. SAN FRANCISCO, CAL.





Clear View Ahead

N. P. Air Operated Cab Window Wipers help to keep rolling stock rolling at capacity

By keeping locomotive cab windows clear of rain or snow, N. P. Air Operated Window Wipers provide the clear view ahead that's so essential to safe and efficient operation.

Built especially for tough transportation service, N. P. Cab Window Wipers are rugged, powerful and their maintenance requirements are negligible. On electric locomotives of the Pennsylvania and New York, New Haven and Hartford Railroads, they have definitely proved their value under the most severe operating conditions.

Manufactured by the builders of N. P. End Door Operators for passenger cars, N. P. Air Operated Cab Window Wipers are a positive help in keeping rolling stock rolling under adverse weather conditions.

Write for complete information.

NP

NATIONAL PNEUMATIC COMPANY

GRAYBAR BLDG., NEW YORK
MITTEN BLDG., PHILADELPHIA
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DISTINCTIVE FABRICS
MMP Co
Mass Mohair

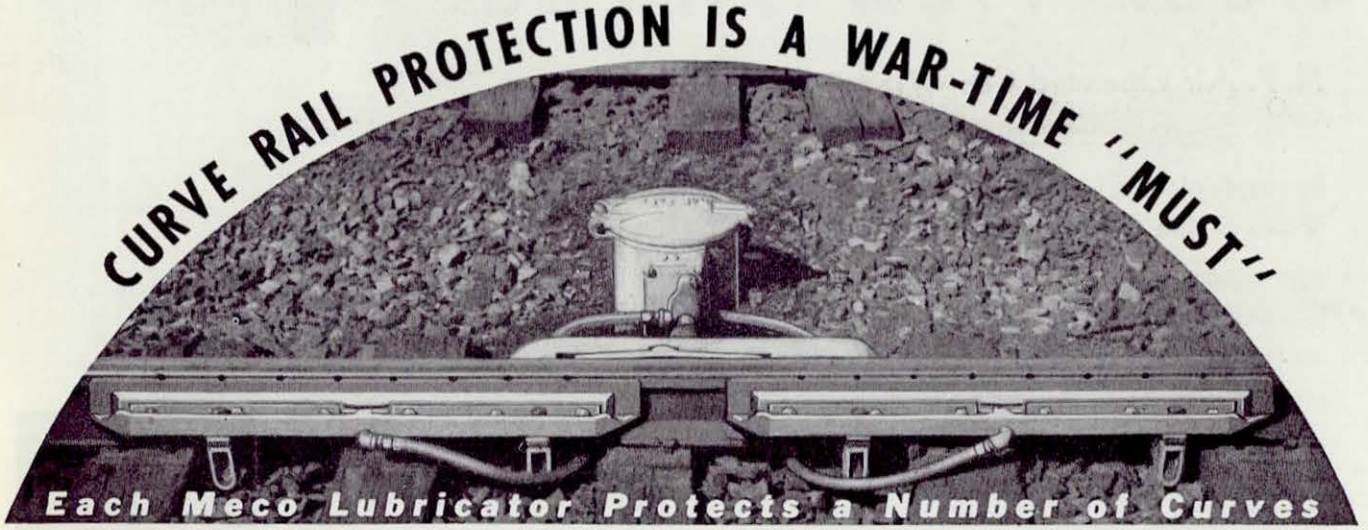
MASS MOHAIR

The Modern Seat Covering

THE inspiring decorative scheme and general utility of "Mass Mohair" has been the principal theme followed in equipping the majority of streamliners during the past eight years. Durable fabrics combined with distinctive colors and designs make Mass Mohair the ideal material for your coach interiors.

MASSACHUSETTS MOHAIR PLUSH COMPANY

BOSTON, MASS.: 80 FEDERAL ST. • NEW YORK CITY: 2 PARK AVE. • PHILADELPHIA, PA.: BEURY BUILDING • CHICAGO, ILL.: 80 E. JACKSON BLVD.



Every railroad man knows curves are the most hazardous parts of the track. Therefore, they receive preferred attention, including daily inspection. Today, railroads have a choice of two methods of maintaining curves, safely.

FIRST

To regauge and respike rails constantly, to keep renewing spike-killed ties, and to replace the rails in curves at frequent periods (if you can *get* new rails).

SECOND

To give curves adequate (Meco) lubrication, thus minimizing flange wear on rails . . . and *make curved rails last as long as tangent rails.*

MECO *Rail and Flange Lubricators*

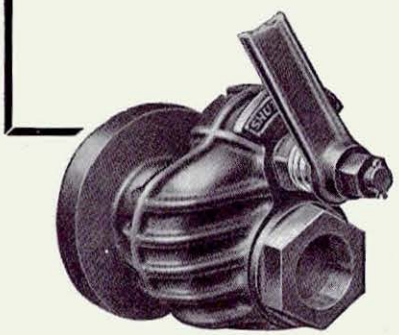
1. Minimize curve rail wear otherwise caused by wheel flange friction; also reduce wheel flange wear, particularly on locomotive wheels.
2. Prolong curve-rail life, prevent frequent rail replacement jobs with their traffic interruptions.
3. Reduce derailment hazards by decreasing curve friction. Thus make possible higher train speeds, with safety.
4. Eliminate or reduce regauging and realigning of curves; also lessen respiking and continual replacement of spike-killed ties.
5. Frequently do away with helper service, or permit increased tonnage ratings through divisions where curvature governs such ratings.
6. Reduce fuel consumption.

MAINTENANCE EQUIPMENT COMPANY Railway Exchange Building CHICAGO, ILLINOIS

Modern Locomotives are

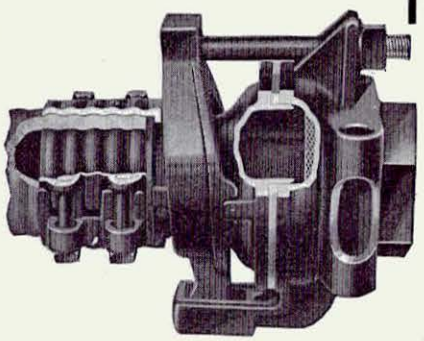
Safer-More Efficient

when equipped with these proven specialties



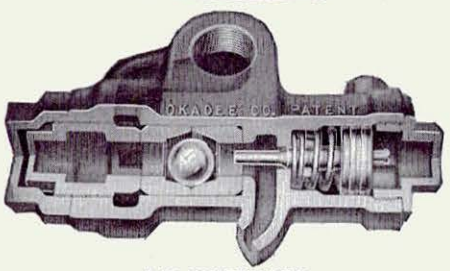
◀–OKADEE BLOW-OFF VALVES

Quick action. Lever operated. Full opening. Valve body cast in one piece. Screwed or Flanged design available in Cast Steel or High Tensil Iron. Simplicity of design permits ready maintenance.



OKADEE TENDER HOSE COUPLER–▶

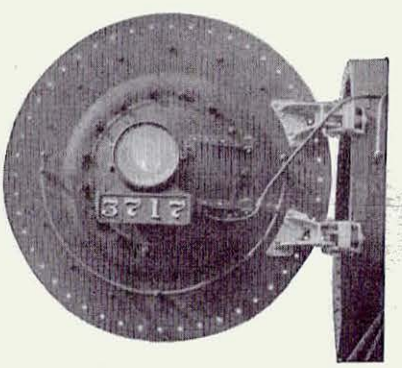
Coupled or uncoupled in only *one* minute. Special clamping system holds hose securely. Straight through flow and ample area through screen assures full capacity for boiler feed. Screen can be easily and quickly inspected and cleaned.



AIR OPERATED

◀–OKADEE CYLINDER COCKS

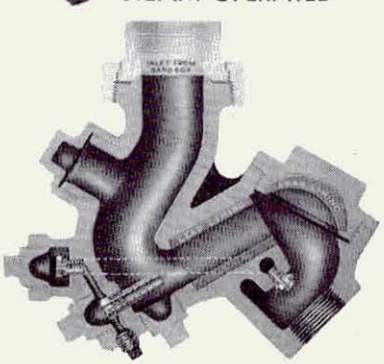
For automatically draining condensation from cylinders. Can be finished in design suitable for steam or air operation. Substantial construction and simplified design guarantees long, effective service.



STEAM OPERATED

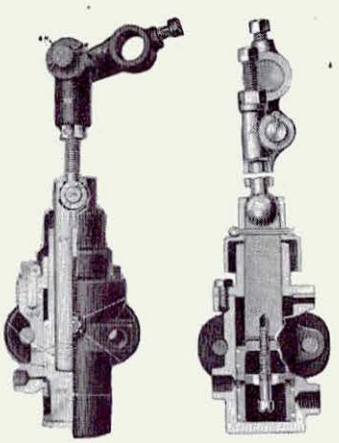
OKADEE FRONT-END HINGE–▶

At remote points or in modern repair shop, the Front End Hinge provides a quick, safe and economical way to open smoke box front. Quickly pays for itself in labor saving.



VILOCO BELL RINGERS–▶

Gollmar or Vacuum Type. Made to suit any type of bell or size of bell frame. Economical in initial cost — substantially made and efficient in operation.



◀– VILOCO SANDERS

A complete line of sander traps are available to suit any design of sand box lug. Made in various types — with or without clean-out feature. Operating valves can be furnished to suit any desired sanding sequence.

Okadee Water Glass Protectors—
Blow-Off Separators—Drain Valves

Viloco By-Pass Valves—Pneumatic Whistle
Operators — Rail Washers — Sand Driers.

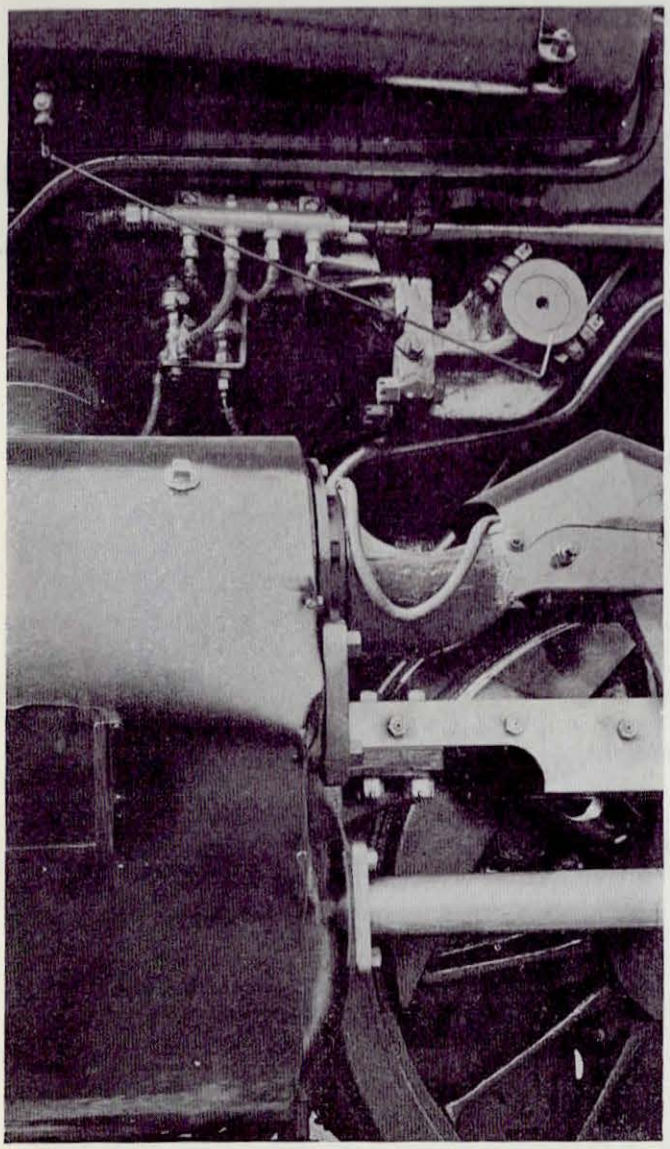
THE OKADEE COMPANY — VILOCO RAILWAY EQUIPMENT CO.

332 SOUTH MICHIGAN AVE.

CHICAGO, ILLINOIS

FLEXIBLE CONNECTIONS

For All Lubrication Lines



FLEX-O-TUBE High Pressure Hydraulic Hose Assemblies provide an uninterrupted flow of lubricant, of any viscosity, to all working parts on a locomotive. It is readily installed and will distribute perfectly under any pressure, absorb the vibratory shocks of locomotive operation—save money in the long run.

FLEX-O-TUBE CO.

Lafayette and Fourteenth Streets

Detroit, Michigan

AUTOMATIC CONTROLS MH

AUTOMATIC DEVICES

for

DIESEL LOCOMOTIVES

and

PASSENGER CARS

Special Equipment Developed to Suit Your Requirements

MINNEAPOLIS-HONEYWELL REGULATOR COMPANY

2834 FOURTH AVENUE SOUTH

MINNEAPOLIS, MINNESOTA

"BOTTLENECK BUSTER" FOR 34 RAILROADS

With the movement of freight up 100%, Krane Kars are eliminating the traffic snarls on the nation's railways. Loading, unloading, transporting, stacking, etc. . . . in the yards, car and repair shops, roundhouses, stores departments . . . wherever fast and efficient handling is required. For details, write for Bulletin 55. Agents in all of the principal cities.

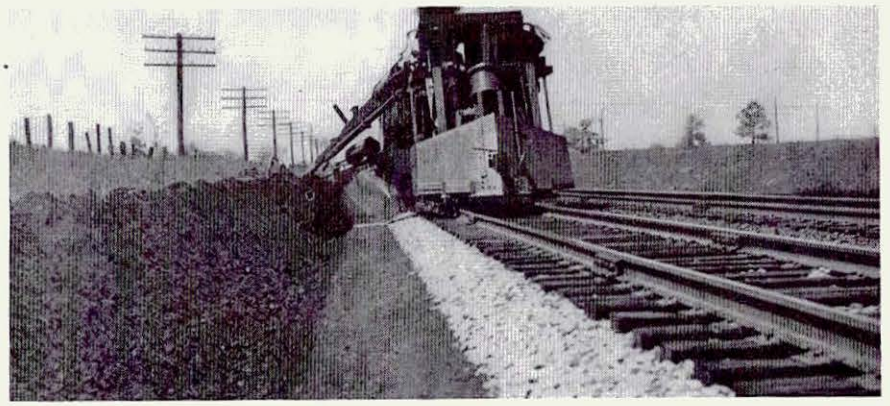
RECENT PURCHASERS: Union Pacific; Great Northern; C B & Q; N. Y. Central; Illinois Central; Pennsylvania; Canadian Pacific; B & O; Chesapeake & Ohio, etc.

Krane Kar
FOR RAILROADS

SWING BOOM TRACTOR CRANE
2½, 5, and 10 TON CAPACITIES

SILENT HOIST WINCH & CRANE CO. 845 63rd STREET, BROOKLYN, N. Y.

JORDAN *Salutes the Maintenance Man who well knows — that to Keep 'em Rolling requires adequate Track Drainage*



PREPARE for heavier traffic to come, by utilizing your present Jordan Spreader-Ditchers to the fullest extent.

- During Summer months spread and shape ballast, level fills, ditch out cuts.
- During Winter months keep your main lines, yard tracks free from snow and ice.
- Make your Jordan last longer by keeping it in good repair.

"DOES THE WORK OF ANY ARMY OF MEN"

O. F. JORDAN CO.

WALTER J. RILEY, President • EAST CHICAGO, INDIANA

WAR WORK?
. . certainly!

Building TOUGH Freight Cars Is Just As Vital As Building TOUGH Armaments

Of course, we're producing other types of war equipment too — but what's more important to the whole war program than having enough dependable freight car facilities to avoid transportation bottlenecks? Every phase of every kind of war production bogs down in a hurry when freight cars can't keep pace with demands. That's why we insist that our most important war work is identical to our peace-time production — building tough, rugged, durable freight cars that can take the punishing grind of today's capacity loads, longer and more frequent hauls and higher speeds with minimum maintenance. Ralston Steel Cars have proved their capacity for this kind of service.

Modern straight-line production methods, pioneered by Ralston in the freight car field, assure better construction through specialized craftsmanship . . . they result in more uniform high quality of materials . . . they bring increased economies that lead to increased values . . . they permit the rigid inspection of every part, and of every stage of construction — an unbreakable rule at the Ralston Steel Car Co.

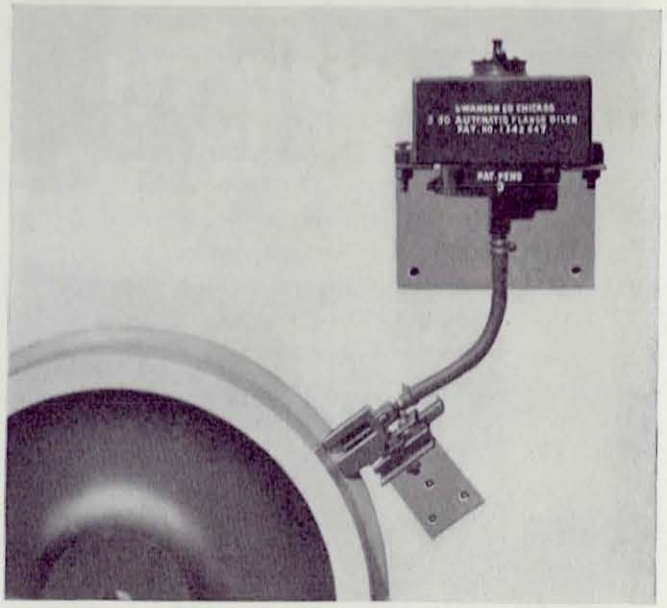
Builders of Railroad Freight Cars and Repair Parts

RALSTON Steel Car Company

COLUMBUS OHIO

Swanson Flange Oilers

100% AUTOMATIC



The NEW IMPROVED DESIGN FOR STEAM and DIESEL LOCOMOTIVES IN EVERY TYPE OF SERVICE

WRITE US TODAY FOR FULL PARTICULARS ON THIS NEW TYPE FLANGE OILER

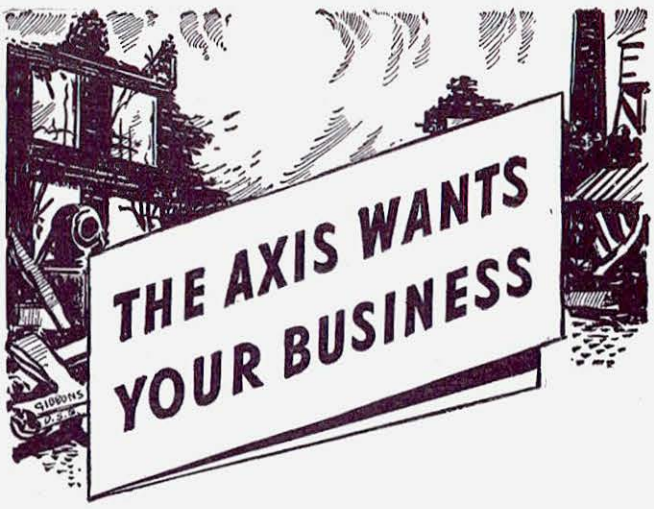
The Automatic Valve supplies the oil to the shoe, which *wipes* the oil on the flange. This keeps the oil on the contour of the flange, where it must be to obtain the maximum savings.

The S-CO AUTOMATIC FLANGE OILERS will save you money—as 4,000 of them are now doing on over 70 other roads.

Try a set of the new type Flange Oilers on a Diesel Switcher and be convinced.

THE SWANSON COMPANY

1644 Farragut Ave. Chicago, Ill.



THIS is more than a war of mechanical monsters clashing in the night . . . more than a war of production.

It is a war for markets—*your* markets! The Axis wants your business—wants to destroy it once and for all.

With so much at stake, there is no doubt you will want to do everything you can to meet this Axis threat. Two ways are open: Speed production and put 10 percent of your income into WAR BONDS! The only answer to enemy tanks and planes is *more* American tanks and planes—and your regular, month-by-month purchases of War Bonds will help supply them. Buy now *and keep buying.*

THE GOAL: 10% OF EVERYONE'S INCOME IN WAR BONDS

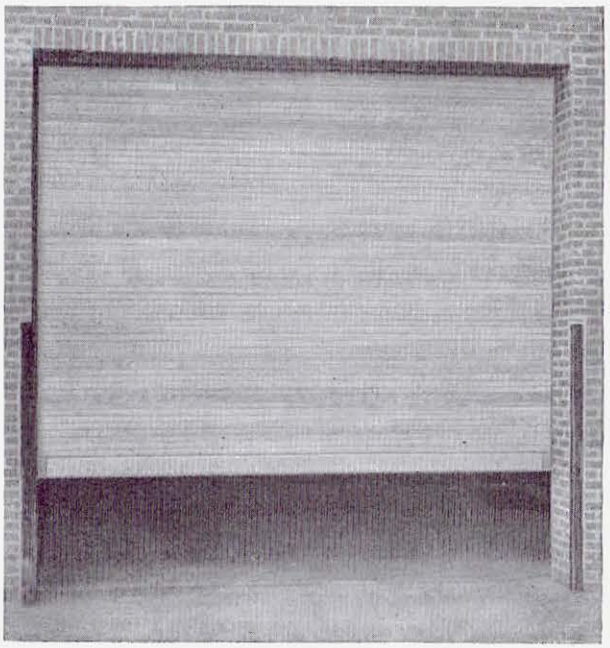
When you install the Pay-Roll War Savings Plan (approved by organized labor), you not only perform a service for your country but for your *employees.* Simple to install, the Plan provides for regular purchases of War Bonds through voluntary pay-roll allotments.

Write for details *today!* Treasury Department, Section R, 709 12th St. NW., Washington, D. C.

War Savings Bonds

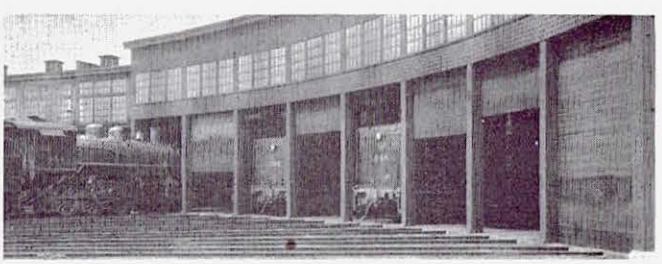
This space is a contribution to Winning the War by
RAILWAY AGE

The KINNEAR WOOD ROLLING DOOR



BACKED BY YEARS OF SATISFACTORY SERVICE!

Under long, hard use such as received in the round-house installation shown below!



PROVED -- AND READY FOR WARTIME NEEDS

You can get up-to-the-minute door efficiency for wartime needs . . . in a thoroughly proved, time-tested door that cuts the use of war-vital steel to a minimum!

You get these things in the Kinnear Wood Rolling Door. It features the same space-saving upward action—the same time-saving convenience—as the famous Kinnear Steel Rolling Door. It opens vertically and coils compactly above the doorway, where it stays out of the way and out of reach of damage until closed.

Motor operation is also available, and one or more remote control stations can be located at strategic points to further facilitate traffic control.

The Kinnear Wood Rolling Door is constructed of rugged wood slats interlapped and jointed with metal cables or tapes —a construction that affords free action but blocks out wind and weather and stands up under heavy usage. Write for full details today! The Kinnear Manufacturing Company, 2020-40 Fields Ave., Columbus, Ohio.

SAVING WAYS IN DOORWAYS
KINNEAR ROLLING DOORS

Inner Seal

INNER-SEAL
WATERPROOFED
WEATHER STRIPPING

KEEPS OUT RAIN, SNOW, DRAFTS DIRT AND CINDERS

Seals locomotive closures, refrigerator car doors, body end doors, vestibule side doors. Protects passengers. Helps maintain steady, even temperatures — a strong, sturdy weather stripping for railroad service.

Write for Complete Information

BRIDGEPORT FABRICS, INC.
BRIDGEPORT, CONN.
Established, 1837

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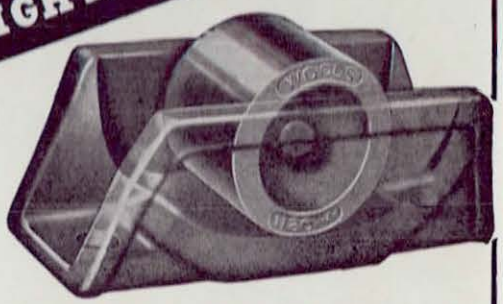

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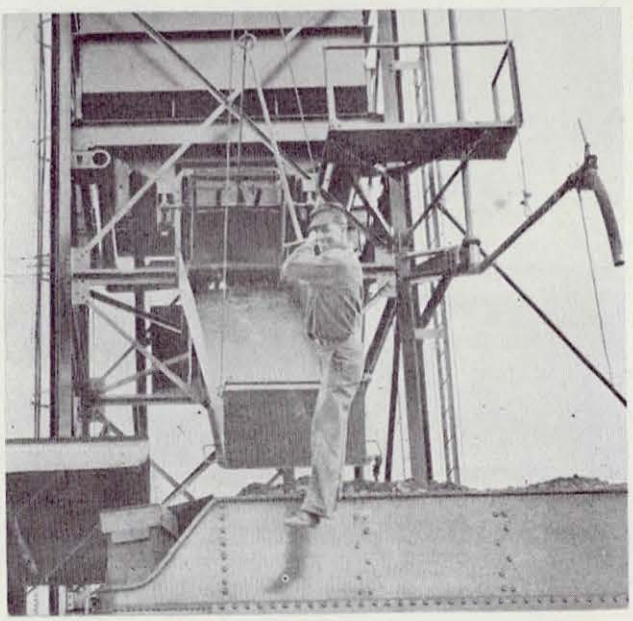

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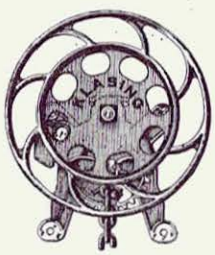

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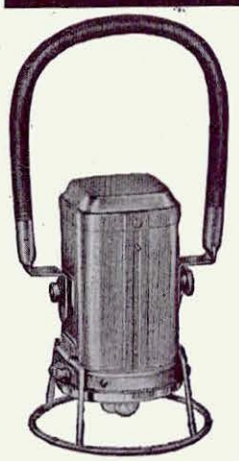

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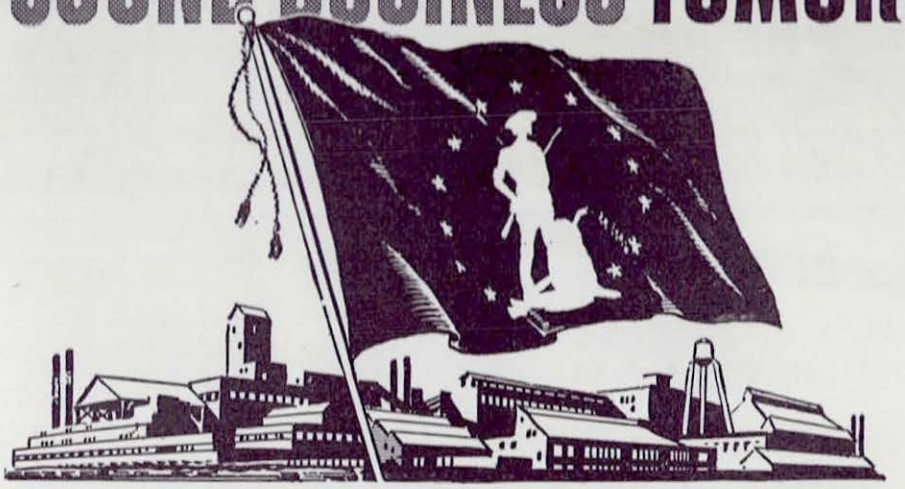

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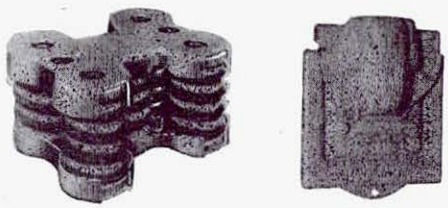

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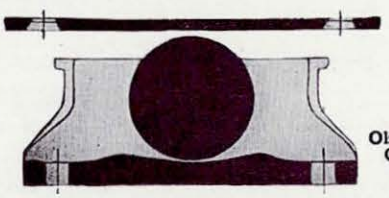

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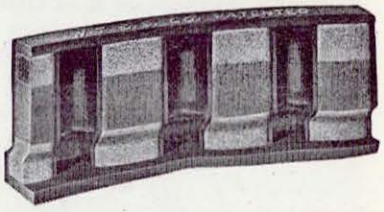

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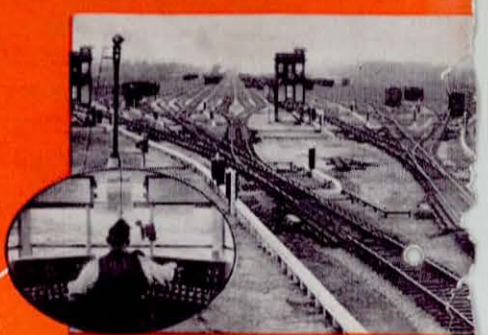

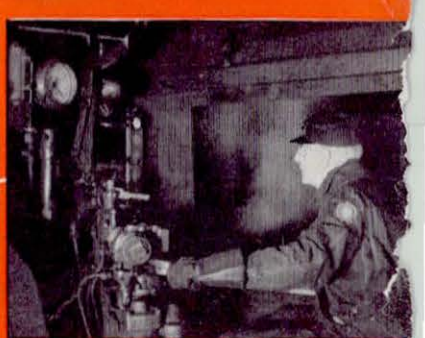

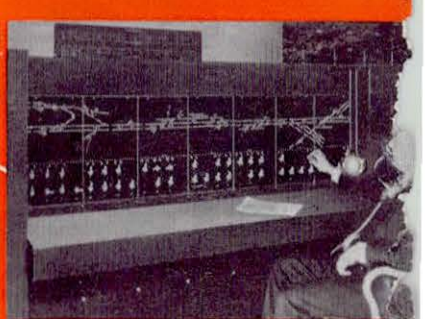

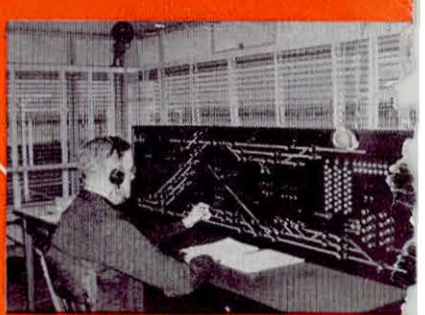

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